U. S. A. $2.00 a Year; Canadian $2.50; Foreign $3.00.

AMERICAN JOURNAL OF VETERINARY MEDICINE

Vol. XII AUGUST, 1917 No. 8

Epizootics and Their Control During War

is intended especially as a guide for army veterinarians. But progressive veterinarians in private practice who are interested in preventive medicine, practical methods of laboratory diagnosis, general disinfection, and the handling of infectious diseases of animals, will be pleased with this new book. Read a further description of it on page 14 of this issue.

Blackleg Filtrate

Lederle

See Advertisement on Page 16

Entered as second-class matter, July 19, 1910, at the postoffice at Chicago, Illinois, under act of Congress of March 3, 1879

Economy and Efficiency

ARE THE TWO CHIEF FACTORS TO SUCCESS

These, Mr. Veterinarian, can be had by using our Prophylactic and Curative Agents.

PRICES REDUCED.

BLACK-LEG SERUM, per 100 C. C.	$1.75
GERM FREE BLACK-LEG VACCINE (Black-leg Aggressin), per dose	.35
BLACK-LEG VACCINE (Pellets), 10 doses	1.00
BLACK-LEG VACCINE (Pellets), 50 doses	4.00
INJECTOR FOR ADMINISTERING BLACK-LEG PELLETS	1.25
CONTINENTAL BIOLOGICAL CASE (Holds Syringe, Needles, Thermometer and Bacterins), each	2.25
HEMORRHAGIC SEPTICEMIA BACTERIN (C. S. L.), per package, 6 vials	1.00
ANTI-INFLUENZA BACTERIN (C. S. L.), per package, 6 vials	1.00
POLYVALENT BACTERIN (C. S. L.), per package of 6 vials	1.00
ANY OF THE ABOVE BACTERINS IN 20 C. C. VIALS (10 doses), per vial	1.50

WE SOLICIT ORDERS FROM VETERINARIANS ONLY

Continental Serum Laboratories Co., Muscatine, Iowa

Lameness of the Horse

To have a limited degree of knowledge of any subject, in such form that it may be put to useful service, is preferable to the possession of much knowledge that cannot be given practical application.

Following an introductory article in Lacroix's "Lameness of the Horse" is a discourse on general causes of lameness. This section serves to give to the careful reader a foundation for the study of diagnostic principles.

Mastery of diagnostic principles will give the practitioner, who needs such training, a useful knowledge of the subject of lameness and, especially, a thorough understanding of the manner in which such knowledge may be most advantageously employed.

Sections three and four are so written that they may either be studied in their regular order of presentation or consulted as reference. Therein the practitioner will find separate and complete discussions of the many topics considered. Perplexing problems of a surgical nature that frequently present themselves to the veterinarian are given careful consideration. The book is well illustrated and is one of the most useful veterinary works obtainable. The price is $3.00, prepaid.

American Journal of Veterinary Medicine

9 So. Clinton St., CHICAGO

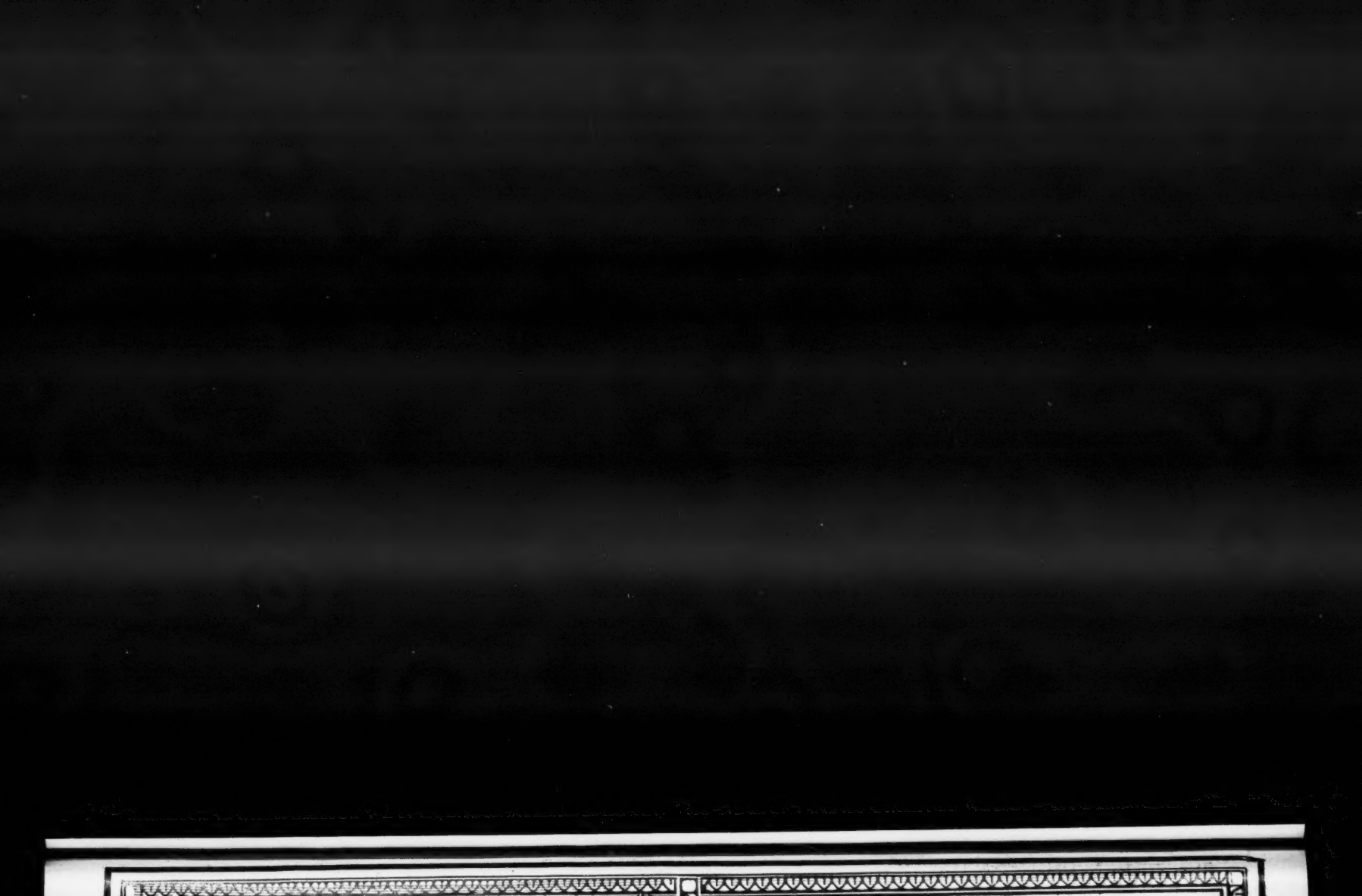


TABLE OF CONTENTS

LEADING ARTICLES Page

Pneumonia, Its Prevention and Treatment as Observed at the British Remount Depot, Newport News, Va., by Jas. Gregg, M.R.C.V.S.; F. X. Maguire, V.M.D.; Andrew Gillespie, D.V.M.; G. S. Glover, D.V.M.; H. W. Laughlin, D.V.M.....505

Anatomical Review and Consideration of Congenital Weaknesses of the Hock of Equidae, by S. L. Stewart, D.V.S.....512

Milk Borne Infections, by Wm. H. Feldman, D.V.M.....515

A Brief History of Veterinary Medicine, by Howard A. O'Brien..518

The Economic Importance and General Prevalence of Periodic Ophthalmia, by W. J. Martin, V.S.....520

EDITORIAL

Fifty-Fourth Annual Meeting of the A. V. M. A.....523

The Use of Iodin in the Treatment of Pneumonia.....527

Book Review.....528

Bulletins of Interest to Veterinarians.....528

QUERIES AND ANSWERS.....529-530

DEPARTMENT OF LIVE STOCK POISONING.....531-534

POINTED OPINIONS ON LIVE TOPICS

Immunity; Tetanus in North China; Mesenteric Hernia in Horse; X-Rays Used in a Surgical Case in a Horse; Rectal Prolapsus in the Horse Successfully Treated by Amputation; Forage Poisoning in Cattle; Cesarean Section in a Cow; Malignant Edema; Urethral Calculus in a Steer; Fatal Glossal Hemorrhage in Dog; Pharyngeal Paralysis; Condemns Standing Castration; Growth Resembling Actinomycosis in a Horse; Trismus; Intussusception in a Four-Day-Old Colt; Metritis and Vaginal Lacerations in a Cow; Equine Cryptorchidism; Action of Sodium Cacodylate; Tetanus in a Shetland Mare; Orchitis in a Jack Relieved by Surgery; Protein Therapy; Antitetanic Serum in Articular Rheumatism; Colic from Ingestion of Wire; Rumenotomy Successfully Performed; Ranula in Horse; etc., etc.

Index to Advertisers.

Page

Abbott Laboratories.....587
American Veterinary Supply Co. .....592, 13, 4th cover
Aurora Serum Co.....584

Beebe Laboratories.....582
Betz, Frank S., Co..... 8
Big O Serum Co.....567
Blakiston's Son & Co.....573

Carter-Luff Chemical Co... 15
Cedar Rapids Serum Co...569
Chicago Post-Graduate Veterinary College 20
Chicago Veterinary College.591
Classified Advertisements... 20
Cleveland, W. G., Co.....585
Coates House 21
Continental Serum Laboratories .....2nd cover
Cooper, Wm., & Nephews..589
Corn Belt Serum Co..... 4
Corn States Serum Co.....563
Crouton Mfg. Co..... 20
Cutter Laboratory of Illinois 570

Eagle Serum Co..... 21
Elmore Live Stock Co.....590
Eucamphine Co., The.....590

Ft. Dodge Serum Co.....565
Fowler Serum Co.....586

Geo. Washington University Veterinary College.....
Gillette Clipping Machine Co. 590
Grain Belt Supply Co.....572

Haussman & Dunn Co.....583
Haussman Instrument Co.. 20
Hueben Serum Co.....577

Imperial Sales Co..... 8
Indiana Veterinary College.591
Iodum-Miller Co.....573

Jensen-Salsbery Laboratories, Inc.....578-579

Kansas City Veterinary College 591

Lathrop Serum Co..... 4
Lederle Antitoxin Laboratories.....16, 17, 18, 19

McKillip Veterinary College.....591
Missouri Valley Serum Co..571
Morrison, Wm. G.....573
Mulford, H. K., Co..... 9

O. K. Serum Co..... 22
Ottumwa Serum Co.....581

Pammel, L. H.....586
Parke, Davis & Co..... 1
Pasteur Laboratories of America 588
Peoria Serum Co.....
Purity Biological Laboratories 580

Ralston Serum Co.....568
Royal Serum Co.....560, 561

St. Joseph Veterinary College.....591
Searle, G. D., & Co..... 3
Sharp & Smith..... 2
Shelton Serum Co....3rd cover
Simonson Serum Co..... 3
Sioux City Serum Co .3rd cover
Sioux Valley Serum Co..... 15
Smith, Martin H., Co..... 6
Southwestern Serum Co....57
Squibb, E. R., & Sons..... 10
Standard Serum Co..... 24
Stock Yards Serum Co..... 23
Swan-Meyers Co. 10

Terre Haute Veterinary College 591
Timmer, Joe, Co..... 5

U. S. College of Veterinary Surgeons 591
Universal Serum Co..... 12

Veterinary Specialty Co....588

Wichita & Oklahoma Serum Co. 581
Wilcox & Harvey Mfg. Co.. 20

"THE SERUM SUPREME"

"SERUM SUPREME" is of the highest potency.
THE REPORTS of results have been highly flattering.
WE SELL TO THE profession only.
UNIVERSAL SERUM is made under Federal supervision.
THE PRODUCTION and selling are entirely in the hands of efficient veterinarians.
OUR COMPANY is thoroughly responsible.

U — UNIVERSAL — U

IN USE
IN NAME
IN SATISFACTION

UNIVERSAL

ANTI-HOG-CHOLERA SERUM

U. S. Veterinary License No. 108

ANTI-HOG-CHOLERA SERUM

Indiana State Permit No. 24

UNIVERSAL

"THE SERUM SUPREME"

UNIVERSAL SERUM is produced in one of the largest, most up-to-date and sanitary plants in the United States.
THE PRICE of Universal Serum is low, considering the high price of live stock and other materials entering into production. Quality is not sacrificed for price.
OUR TRANSPORTATION facilities are unexcelled. Thirty-seven railroad lines emanate from this city.

Your order by letter, telegraph or telephone will receive prompt attention, day or night.

Write for one of our new booklets entitled "What Hog Raisers Should Know." A quantity for distribution will be furnished free of charge.

C. B. SIMMONS, D. V. S.
VICE-PRESIDENT AND MANAGER

SWAN-MYERS COMPANY, Eastern Distributors
219-223 N. Senate Avenue
INDIANAPOLIS, INDIANA. Both Phones

UNIVERSAL SERUM CO.
101 St. Clair Ave.
EAST ST. LOUIS, ILL. Bell-Bridge 920
Branch House: 442 E. 3rd St., DAYTON, OHIO

AMERICAN JOURNAL of VETERINARY MEDICINE

PUBLISHED MONTHLY. Copyright 1917 by D. M. CAMPBELL, CHICAGO, U. S. A.

VOL. XII AUGUST, 1917 No. 8

Pneumonia, Its Prevention and Treatment As Observed at the British Remount Depot, Newport News, Va.*

Introduction

By JAMES GREGG, M. R. C. V. S.

I THINK it will be universally agreed that 95 per cent of the usual death rate at a remount depot is due to some form of chest disease—pneumonia or pleuro-pneumonia. We consider this fact, together with the entry of the United States into the war, a sufficient reason for offering these notes.

It took us one and a half years to develop and coördinate the best means of handling and treating sick remounts. The results we have had during the last year, encourage us to think that we have been in some measure successful in saving horse life. The official figures show that we have made a saving of four to one. It is only right, therefore, that, according to Mr. Llovd George, you should benefit by our mistakes, which were:

1. Purchasing horses with too little resistance.
2. Using forage with insufficient nutriment.
3. Dosing with all kinds of drugs and vaccines.
4. Insufficient attention to weak animals.
5. Insufficient attention to isolation and disinfection.
6. Veterinary and nursing staff too small.
7. Too much crowding in small pens.
8. Insufficient shelter.

These mistakes were unavoidable in the early rush as the horses had to be got quickly to meet the pressing demands in France.

Now we (1) get the animals under treatment early; (2) use serum in all fever and dopy cases; (3) isolate carefully, feed well and disinfect thoroughly; (4) give all animals individual attention.

The brain power of the veterinarian should be focused on preventing pneumonia. This can be done by giving the newly purchased animals serum (described later), by feeding and watering them well, by giving them good rests in suitable pens on their journey from the Middle West to the coast.

Our veterinary officers are allowed all necessary initiative in dealing with

*By Jas. Gregg, M. R. C. V. S.; F. X. Maguire, V. M. D.; Andrew Gillespie, D. V. M.; G. S. Glover, D. V. M.; H. W. Laughlin, D. V. M.

individual cases, but experience has shown that a coördinated system along proper lines is necessary. For example, a system must be inaugurated on the following lines:—all sick or injured animals must be fetched into an outside pen where the veterinarians diagnose the complaints and then the animals are sent to the proper pen for treatment:

1. Surgical pen.
2. Contagious disease pen.
3. Pneumonia pen.

Then certain principles are laid down which each veterinary officer must comply with, i. e., they must (on broad lines) bleed and give normal salt solution with iodin for pneumonia; they must use serum in all fever cases; they must use dimethylarsenate compound (an imitation of 606) in all chronic cases and cases that are likely to go septic, etc. After that they are allowed every latitude in accordance with reason.

The serum we are using at present is drawn from recovered pneumonia cases, which have been hyper-immunized with large numbers of the most virulent strain of streptococci we can find on post mortems. We determine their virulence by the use of rabbits. Serum animals that give a reaction are put to one side and hyper-immunized again, if necessary, in a month's time. Those that stand the test are used for serum one week after getting the last dose of streptococci. Serum prepared in this way is very potent and has a marked curative effect in all kinds of fevers and influenzas, but its chief value lies in the fact that it is a valuable preventive of pneumonia.

By reading the notes of Doctors Maguire, Gillespie, Glover and Laughlin, the present members of our staff, the reader will get an idea of how we arrived where we now are, together with the reason for standardizing certain systems of treatment.

In conclusion, I would say that the veterinary profession is on trial in the United States—if it gets its proper chance, it should take it, but it must be allowed to dictate in all veterinary matters. Millions have been saved to the Allies by the proper application of veterinary science, and millions have been lost by the improper application of the same.

Diagnosis, Complications, Surgical Treatment and Sequelae of Pneumonia in the Mule

By ANDREW GILLESPIE, D. V. M.

Symptoms—The clinical symptoms manifested depend upon the virulence of the infection. At first we may observe dullness and impaired appetite; temperature varying from 103° F. to 105° F.; pulse 60 to 90, rapid and full. The visible mucous membranes are congested or may have an icteric tinge. The respiration varies according to the extent of the pulmonary lesions; in many instances it is not sufficiently disturbed to attract attention, and in other cases it may be greatly accelerated, with marked dyspnea, expiration being accompanied with a sigh. A characteristic nasal discharge is usually present; oftentimes it is of a rusty color or of a blood-stained tinge. The latter is invariably an unfavorable symptom.

Ausculation—On ausculation various abnormal sounds may be heard, depending upon the stage of the disease. The most common is of a tubular blowing character or of a coarse bronchial breathing over the lower part of the chest where normally the moist vesicular murmur is heard. These sounds are coarser than normal and of equal length during inspiration and expiration. They resemble somewhat the normal sounds heard over the lower part of the trachea. At times sounds of a cooing or squeaking character may be heard depending upon the various pathological changes taking place in the thoracic cavity. In abscess formation and gangrene, peculiar bubbling or gurgling sounds may be present, which are usually associated with a fetid odor of the breath.

Prognosis—In uncomplicated cases,

especially if the affection is unilateral, prognosis is favorable, but if bilateral, it should be guarded, as relapses are likely to occur and complications develop even when the patient seems to be on the way to recovery. In unfavorable cases, there is inappetence, great depression, the ears are drooped, conjunctiva greatly discolored, pulse small and weak and gradually becoming imperceptible. There is marked dyspnea, the gait becomes unsteady, and the animal finally falls and dies.

Complications—Of these the most commonly met is pleurisy, which is usually present to a varying degree in the majority of cases. The symptoms are intermingled with those of pneumonia, the patient refusing to move, and if forced to do so, emitting a grunt or groan. The breathing is of the abdominal type and is carried on in a jerky manner.

Cardiac Complications—These are usually obscured by the preëxisting pneumonia and only discovered on post mortem, pericarditis being the most commonly observed.

Renal Complications—Nephritis may occur during the course of the disease and is manifested by uneasiness, frequent attempts at micturition and voiding of small quantities of urine, arching of the back and stiffness in the hind limbs on progression.

Sequelae—Pulmonary gangrene is by far the most common sequel and usually appears suddenly. At first the symptoms may be attributed to a relapse; the patient loses in weight; the pulse becomes small and weak; the temperature rises; the eyes have a peculiar staring expression; a characteristic dark, greyish discharge issues from the nostrils, which has a very foul odor. A profuse diarrhea usually sets in at this stage, and the subject dies, showing all the evidences of a generalized septicemia.

Chronic pneumonia is occasionally met with, and the symptoms are rather indefinite. After the primary disease has run its usual course, the animal fails to recover completely, remaining emaciated and unfit for service. Cough and dyspnea are also present in a varying degree in these cases.

Affections of joints and synovial sheaths—Arthritis and synovitis of a metastatic character may appear suddenly during convalescence. An acute and obscure lameness may be the first indication, and this is followed by heat, pain and swelling of the affected region.

Prognosis should be guarded in such cases for the animal may be left permanently blemished or a hopeless cripple after long and costly nursing. In some cases the larger joints are affected. Setoning seems to be beneficial. Lately we have got good results and quick recoveries from the use of dimethylarsenate compound given subcutaneously.

Operative Treatment—This consists in tapping the chest. In order to be successful, this operation should be resorted to early, as soon as the symptoms of the accumulation of exudate are well marked, and repeated daily or every second day until an improvement is noticed. In the majority of fatal cases on which post-mortem examinations were held, a varying quantity of effusion was found in the pleural cavities. This seemed to be the chief cause of death; the object of the medicinal treatment, therefore, should be aimed at prevention of the formation of this fluid. Tapping does no harm if reasonable precautions to prevent sepsis are taken. Even in cases where no fluid can be drawn, tapping seems to be beneficial, and the results are surprising; the temperature drops, appetite returns and there is a marked improvement in the condition of the patient. It might be mentioned that the precautions recommended by some text-books against the entrance of air are unnecessary in our experience, and it is barely possible that a little air entering the thoracic cavity in this way is beneficial. At any rate, we are certain that it does no harm. But in old cases of long standing, where a large quantity of fluid is withdrawn, no permanent benefit is likely to result, and in these, care must be exercised to guard against shock; otherwise, the patient may succumb in the midst of the operation. In guarding against shock, large quantities of normal saline

solution given intravenously have proved valuable.

Technic of Operation—This is simple in the extreme. The site usually selected is the intercostal space between the sixth and seventh ribs and as near their distal termination as possible. The hair is clipped and the skin painted with tincture of iodin. The trocar is then inserted at a spot close to the anterior border of the rib and is pushed obliquely inward, upward and forward. By inserting it in this manner, one avoids striking a rib. The trocar is then withdrawn from the cannula and the fluid if present is allowed to run out. The cannula should be immobilized with the fingers; otherwise it will move about with the respiratory movements to the extent that it may interfere somewhat with evacuation of fluids.

Medicinal Treatments Tried for Pneumonia

By F. X. MAGUIRE, V. M. D.

Nearly every issue of veterinary literature, both in this country and abroad, contains one or more treatise on the treatment of pneumonia. The object of this paper is to show the results of various treatments and not to introduce any specific.

During the past two and one-half years, the classification of our pneumonia cases has been about as follows:

1. Catarrhal, bronchial or lobular..96%
2. Gangrenous or septic..... 3%
3. Croupous, fibrinous or lobar—.... 1%

Treatments—Counter-irritation has been found beneficial only when applied in the very early stage (congestion).

Counter-irritants used: Mustard and tincture of iodin. Tincture of iodin when applied with a stiff brush (after clipping the hair from the parts) produces a very marked edematous swelling. It is not as destructive as mustard and is, therefore, preferable on better bred animals.

Drenches—We have deduced this conclusion from our work: drenching of pneumonia cases is far more injurious than beneficial. Naturally one asks why? At least twenty-five per cent of horses suffering from pneumonia or influenza have either pharyngitis or laryngitis or both. We have seen many such cases succumb to gangrenous pneumonia when treated experimentally.

Stimulation may be derived from the use of hypodermic injections of various agents. Strychnin sulphate has in our opinion proved best.

Nuclein, theoretically the specific for influenzoid diseases and complications, is practically of no value.

Camphor and creosote in oil, prepared for intratracheal use, is of no value.

Gilbert's treatment—For about three months we were informed that Italian veterinarians were having splendid results following this treatment. In this treatment patients are injected subcutaneously with pleural exudate of animals suffering from pneumonia, the object being to stimulate to a higher degree the production of antibodies or antitoxins. The following tables show our results with this treatment on two cases:

Case No. 1

Subject: bay mare (cavalry).

Admitted March 1, 1917; temperature 103° F.; pulse 62; respiration 24.

Auscultation: pneumonia, one lung.

March 1, 1917, paracentesis thoracis; removed 500 c. c. pleural exudate, amber colored; injected 100 c. c. pleural exudate subcutaneously.

March 3, 1917, temperature 103.2° F.; pulse 58; respiration 22; withdrew 250 c. c. pleural exudate; injected 100 c c. pleural exudate subcutaneously.

March 5, 1917, temperature 103.6° F.; pulse 64; respiration 24; withdrew 450 c. c. pleural exudate; injected 100 c. c. pleural exudate subcutaneously.

March 6, 1917, patient dead.

Post-mortem—pleuropneumonia.

Case No. 2

Black gelding (artillery).

Admitted March 4, 1917; temperature 104° F.; pulse 70; respiration 28.

Auscultation: pneumonia, one lung.

March 3, 1917, withdrew 400 c. c.

pleural exudate; injected 100 c. c. pleural exudate subcutaneously.

March 5, 1917, temperature 103.6° F.; pulse 66; respiration 28; withdrew 500 c c. pleural exudate; injected 100 c. c. pleural exudate subcutaneously:

March 7, 1917, temperature 104° F.; pulse 72; respiration 30; withdrew 500 c. c. pleural exudate; injected 100 c. c. pleural exudate subcutaneously.

March 8, 1917, patient dead.

Post-mortem—lobular pneumonia.

Intravenous Medication — Through courtesy of the Bureau of Animal Industry, under their direction, the following tables show results of Salvarsan (606) on three horses.

CASE No. 7.
Black Gelding (Artillery)
Pneumonia.

Date 1917	Temperature	Pulse	Respiration
Nov. 27	104.3°F.	76	30
Nov. 27	104.2°	75	30
Nov. 28	102°	60	24
Nov. 28	103°	60	24
Nov. 29	102°	56	22
Nov. 30	102°	48	22
Dec. 1	101°	48	20
Dec. 2	101°	48	20

CASE NO. 8
Black Gelding (Cavalry)
Pneumonia.

Date 1917	Temperature	Pulse	Respiration
Nov. 27	102°F.	60	28
Nov. 27	102°	58	26
Nov. 28	101°	56	22
Nov. 28	101.2°	48	22
Nov. 29	101.2°	48	22
Nov. 30	100.6°	48	20
Dec. 1	100.4°	48	20

CASE NO. 9
Bay gelding (Artillery)
Pneumonia.

1917 Date	Temperature	Pulse	Respiration
Nov. 27	102.2°F.	86	33
	104.2°	78	30
Nov. 28	104°	82	40
Nov. 29	Dead.		

Post mortem:—pleuropneumonia.

Several other arsenical preparations such as Venarsen (a special preparation of sodium dimethylarsenate) and Donovan's solution, have been tried with varying results.

Normal Saline Infusion—The best results from medicinal treatment have been from the above. Of course, cases have their own individualities. Some cases are bled several quarts before infusing the normal saline solution. Again iodin is added to the solution in the proportion of one dram to the quart. The amount given may vary from one to three quarts. It is needless to say that with any intravenous medication the area of operation should be properly prepared and the apparatus sterilized.

Experimental Treatments of Pneumonia

By G. S. GLOVER, D. V. M.

In order to give the reader a clear idea of the different treatments tried and results obtained in treating "lungers," it is well to touch first on the equipment and management of the hospital.

All animals coming into hospitals are examined and only those needing careful attention are put in stalls. Others, slightly affected, are bled about one gallon and given normal salt, one quart, with soluble iodin, one dram, intravenously, and turned out in a special pen to be watched daily for further developments Of these no record is kept.

The hospital stalls are in a double row, under one roof, each about twelve by ten feet and open on all sides. Each stall has separate feed, water and salt pans. One man is detailed to see that every animal is fed on whatever feed is considered best. Whenever an animal is discharged from a stall, the attendant collects and disinfects both the feed and water pans. Another man is detailed to keep the stalls clean and disinfected. Each stall is numbered and the animal placed therein is also numbered, thereby enabling us to look up previous records of any "comeback" cases.

Discharged animals are put into the first convalescent pen, from which the fittest are removed weekly into the second convalescent pen, and from there out into the shipping pens.

During the winter months, bedding and blankets are used. Great benefit has also been derived from the use of a "pneumonia jacket." This jacket is made from a grain sack, stitched snugly around the chest walls and held in place by a breast collar, also of sacking, which is stitched to the jacket.

Daily records of thirteen different

medicinal treatments have been kept, showing 223 cases treated, viz.:

No. 1. Bleeding and normal salt and soluble iodin[1] given intravenously.

No. 2. Bleeding and normal salt given intravenously.

No. 3. Bleeding.

No. 4. Bleeding and sodium dimethylarsenate comp. given intravenously.

No. 5. Normal salt and soluble iodin given intravenously.

No. 6. Sodium dimethylarsenate comp.[2] given intravenously.

No. 7. Venarsen given intravenously.

No. 8. 606 given under supervision of Dr. Ward of B. A. I.

No. 9. Drugs administered orally.

No. 10. Counter-irritation by mustard and mercury and this covered with pneumonia jacket.

No. 11. Subcutaneous injection of counter-irritants.

No. 12. Pleural fluid injections, 100 c. c. subcutaneously; in some cases from the subject's own fluid; in others with fluid from another animal.

No. 13. Mixed treatment: where a combination of the above has been used according to indications.

The summary of these cases tabulated, is as follows:

		Prognosis				Physical Condition of Animal						
Treatment	No. of Animals Treated	Favorable	Fair	Guarded	Unfavorable	Good	Fair	Poor	Average No. Days Under Treatment	Recovered	DEATHS	Percentage Of Deaths
No. 1	120	39	43	21	17	94	24	2	7½	107	13	10.83%
No. 2	5	2	1	1	1	3	2		8	4	1	20.00%
No. 3	5	5				5			6	5	0	0.00%
No. 4	7	3	3		1	7			7½	6	1	14.28%
No. 5	6	4		2		4	2		7	5	1	16.66%
No. 6	6	2	3	1		5		1	7	4	2	33.33%
No. 7	6	2	1	2	1	3	3		7	4	2	33.33%
No. 8	4	2	2			2	2		8	4	0	0
No. 9	5	4		1		1	4		8	4	1	20 %
No. 10	8	5	1	1	1	5	3		7½	5	3	37.5 %
No. 11	7	5		1	1	5	2		7½	4	3	42.85%
No. 12	9	4	1	3	1	8	1		8	4	5	55.55%
No. 13	35	11	8	10	6	24	9	2	10½	17	18	51.42%

Explanation of Table

In No. 1 it will be noticed that 17 were "unfavorable" and 21 "guarded." This and other trials convinced us that No. 1 gives the best results. The remainder of the table contained very few unfavorable cases. Nos. 3 and 8 show no deaths, but these experiments contained no "guarded" or "unfavorable" cases. In No. 9 an oral treatment recommended by some, was tried and found wanting. As to No. 13, in this experiment a few mixed treatments were tried.

Sample of Case Record Forms Used

Animal—mule Age—5 years Diagnosis—pneumonia
Sex—gelding Color—brown Physical condition—good

Date, 1917	Temperature	Pulse	Respiration	Prognosis	Treatment
Feb. 23	102.2	84	36	Fairly good	None—patient watched.
Feb. 24	102	84	36		No improvement; patient bled. N. S. 1*
Feb. 25	102	96	36		N. S. 1*
Feb. 26	100	70	24		
Feb. 27	100	54	30		Patient cut in pen No. 1.

Note: Sudden decrease in pulse rate from 96 to 54. Although weak at time of bleeding, pulse was good three days later.

*N.S.1=Normal saline solution, one quart, and iodin, two drams.

Method of Procedure Adopted in the No. 1 Treatment

The jugular vein is raised by compression with cord and a small area is clipped and painted with iodin. The animal is bled, about one gallon of blood being removed by the use of a large caliber slip hypodermic needle, 1½ inches long. Immediately after bleeding and through the same needle, normal salt, one quart with soluble iodin, one dram, is injected by use of Fowler's salt solution apparatus. The adapter fitting the slip of the needle makes only one puncture necessary for the bleeding and administration of medicine (I have yet to see my first

[1]Soluble iodin with potassium iodid coefficient of one was used.

[2]This is an arsenical preparation that is as nearly like "606" (salvarsan) as it is possible to make without elaborate facilities. This compound contains approximately dimethylarsenate, four grams; succinate of mercury, two grams; and iodin, four grams.

jugular infection from this method).

Daily or every two or three days, the injection is repeated according to results. Bleeding is also repeated in a few days if a full pulse is noticed. This treatment has been found beneficial even in cases where the pulse contraindicated bleeding. The results in many cases were nothing short of wonderful.

In our work animals have to be hastened to the convalescent stage in order to make room for new arrivals, but full time is given in the convalescent pen for a complete recovery before they are moved to the shipping pen.

Strychnin (one grain t. i. d.) is given as a tonic to all animals off feed. Tapping is resorted to when indicated

Prevention and Treatment of Pneumonia Aboard Ship

By H. W. LAUGHLIN, D. V. M.

Of all ills to which horses and mules are subject aboard ship, pneumonia and its complications are the most dreaded, due not only to its treacherous course, such as we see it on land, but more so because of the unfavorable conditions on ship board, such as lack of ventilation and proper surroundings, and worst of all, the rocking of the ship in rough weather. The latter, I think, has caused more deaths in animals suffering from pneumonia than any other single factor.

Prevention aboard ship is of far greater importance than treatment, and in my experience of fourteen trips with animals, I will say that the best methods of prevention are: first, frequent and careful observation of all animals; second, immediate removal of any animal manifesting evidence of fever or dullness. Ailing animals should be removed to the best ventilated and most roomy place available and kept constantly supplied with fresh water. With this, I always give the serum aforementioned with good results.

As to treatment on board ship, one generally gets the animals in the primary stage of disease, when, as a rule, they have a good, strong, full pulse. In such cases they should be immediately bled, taking from four to six quarts of blood and in about an hour injecting into the jugular vein three pints of normal saline solution containing one dram of soluble iodin. As a rule I repeat the injection of the salt solution and iodin in forty-eight hours.

Other than this treatment and the usual symptomatic treatment, such as stimulants, etc., and performing of thoracentesis when necessary, I do not administer anything.

However, this does not apply to cases of septic pneumonia, as treatment of any kind for them is worse than useless They not only all prove fatal, but are a source of infection to other animals and should be destroyed and thrown overboard as soon as detected.

In carrying 13,000 mules and horses to Egypt, Salonica, England and Ireland, my losses were 38 or .029 per cent. During my last nine voyages, I lost only twelve animals or .012 per cent. Seven of these voyages were to Egypt, covering 24 days on board each time. This in itself speaks well for the system of preventive treatment used. Of the 38 deaths, 50 per cent were due to causes other than pneumonia.

The colt that's back'd and burden'd being young,
Loseth his pride, and never waxeth strong.—Shakespeare.

Remember this,—that there is a proper dignity and proportion to be observed in the performance of every act of life.—Marcus Aurelieus.

Anatomical Review and Consideration of Congenital Weaknesses of the Hock of Equidae

By S. L. STEWART, D. V. S., Kansas City

THE hock joint, including the soft structures, is anatomically and physiologically one of the most complicated of all articulations in the horse. More visible malformations, both congenital and accidental, occur in this region than in any other. The reasons are:

The acuteness of the angles of the bony column of the pelvic limb at the hock.

The power, propelling the body, is expended principally upon the pelvic limbs.

A careful review of the anatomy and some of the physiology of the hock is necessary to an understanding of its defects.

Arrangement of the Bones of the Hock

The hock is a composite joint made up of a number of bones that articulate in such manner as to make it very complex. For convenience of description, the tarsal bones should be described in three rows, with the fourth tarsal bone (cuboid) forming the lateral part of the two lower rows.

Arthrology

Four separate articulations are present: the tibiotarsal, proximal intertarsal, distal intertarsal and tarsometatarsal. The hock joints are diarthrodial, but each is classified according to its movement. The tibiotarsal articulation is a ginglymus joint having flexion and extension movements only, while the other three articulations are arthrodial and have gliding movements.

The joint capsule (capsular ligament) surrounds the entire hock joint and is composed of two membranes, one a dense, white, fibrous outer layer, and the other a synovial inner layer. The outer, fibrous layer surrounds the hock from its proximal attachment around the distal end of the tibia, above the margin of the articulating surface to its distal attachment, around the proximal end of the metatarsal bones and below the margin of the articulating surface. The outer fibrous layer also firmly attaches to all the tarsal bones where it comes in contact with them. It is reinforced at several places with very strong bands of white, fibrous tissue, which blend with it and are known as tarsal ligaments.

The other portion of the joint capsule, the inner layer, is a delicate and highly sensitive structure that secretes synovia for lubrication of the articulating surfaces. The synovial membrane is divided into four different parts, named according to the names of the joints around which they form closed sacs, and are known as the tibiotarsal, proximal intertarsal, distal intertarsal and tarsometatarsal sacs.

The tibiotarsal sac, including also the fibrous layer, is extensive. This permits free and extreme flexion and extension of the joint without injury to the capsule. The joint capsule is bound down by tendons and ligaments, except at its antero-medial part, where it forms a fluctuating prominence, and a small part (sac) extending upward between the tibia and fibular tarsal (calcaneum) bones, that is related to the proximal end of the tarsal sheath. The tibiotarsal sac communicates with the proximal intertarsal sac, which is much smaller, less extensive and less important. The other two sacs are distal intertarsal and tarsometatarsal, which are also less extensive and do not communicate with the proximal sacs.

The joint capsule is reinforced in a number of places by the tarsal ligaments, annular ligaments and the ten-

dons of muscles that cross the joint. Located and connected with the joint capsule and ligaments, are grooves for the passage of tendons. These grooves are surrounded by tendon sheaths. The tendon sheaths are similar anatomically and physiologically to the joint capsule.

There are eight tendons that cross the hock, and five of these pass through sheaths. Besides these sheaths, there are four bursae—*bursa gastrocnemii,* under the gastrocnemius tendon; *bursa calcanea subtendinae,* between the tendon of the gastrocnemius muscle and the tendon of the superficial digital flexor (perforatus) muscle; *bursa subcutanea,* between the tendon of the superficial digital flexor (perforatus) muscle and the skin at the point of the hock; and the *bursa tendonea* of the medial tendon of the tibialis anterior (muscular part of the flexor metatarsi).

Conformation of Bones and Tendons

It has been observed in the dissecting laboratories that great differences in conformation of bones and tendons exist in different horses. For illustration, Fig. 1 is of a carriage horse that was sent to the Kansas City Veterinary College to be destroyed. This animal had reached the age of twenty-three years. The history of the horse was easily procured. The horse was bought at the age of five or six years and was driven on the pavements of Kansas City as a carriage horse until a few months before he was destroyed. He was in a runaway and colliding with a telegraph pole, fractured the neck of the right femur; otherwise, no blemishes existed at the time of destruction. A study of the conformation of this old carriage horse will show why he went through life unblemished. The legs are broad and flat and contain a small amount of compact areolar tissue and, therefore, are not so susceptible to cellular infiltration. The tendons and muscles stand out prominently, giving the leg a broad, flat appearance and great

Fig. 1

Fig. 2

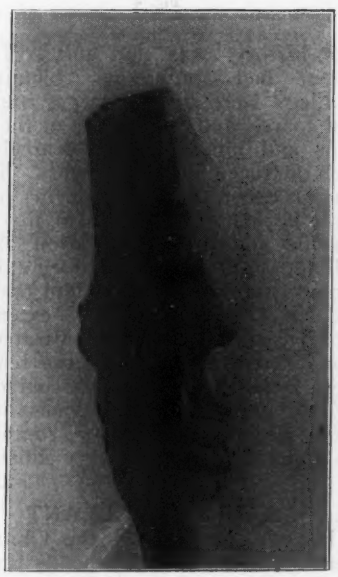


Fig. 3. A sound hock. From horse shown in Fig. 1

strength. A cross section of the bone (Fig. 2) showed it to be of the same good quality, compact and strong.

Figure 4 depicts a nine-year-old horse weighing about 1400 pounds, of common breed. This horse had been used for draft purposes on the pavements of Kansas City for some time;

Fig. 4

the history was indefinite. This horse had numerous blemishes; the legs were unduly large, rounded and coarse, and the outline of the tendons and muscles could scarcely be seen or traced with the fingers. There was an exostosis (bone spavin) of the right hock. A distension of the joint capsule and great infiltration of the cellular tissue of the entire leg existed. Upon dissection it was found that the areolar tissue was very extensive, loosely arranged and infiltrated to some extent throughout; the tendons were large and their fibers coarse and loosely arranged. The bones of the limbs were unusually large, containing an undue amount of spongy substance.

The Quality Factor In Blemishes

After a careful study of the quality of hair and skin in their relation to the quality of bones and other structures (especially the limbs) of several hundred dissecting subjects, and by almost daily observation of different breeds of horses working on streets and elsewhere, it seems that congenital conformations, and especially the quality of bone and soft structures, are responsible for most blemishes. However, many are found to be accidental.

It is held in some parts of the country that where a horse has a blemish by the time he is four years old, unless caused by some traumatism, the blemish is the result of congenital defects. Upon examination of cross-sections of the bones of such horses, they are found to be deficient in compact substance, and in such cases the compact substance is really less dense than in sound horses. In the horse the soft structures of the hock correspond in

Fig. 5

quality to that of the bones. In a horse the quality of whose bone is as in Fig. 5, the soft structures as well as their fibers are loosely arranged, and bog spavins, thoroughpins, curbs, distended tendon sheaths and cellular infiltration of fasciae of the hock and metatarsus are frequently seen.

A FLY REPELLANT

Bulletin No. 267 of the Ohio Experiment Station recommends the use of 100 parts of fish oil, 50 parts of oil of tar and one part of crude carbolic acid as useful for keeping flies off cows for a time. Another formula given is one-half gallon of oil of tar, one-half gallon cottonseed oil and one-half pint of crude carbolic acid. The above formulae are very effective in affording cows relief from annoyance from flies for several hours, but one must expect these agents to "gum up" the hair and keep it so as long as they are employed.

Milk Borne Infections

By WM. H. FELDMAN, D. V. M., Ft. Collins, Colo.

MILK AS an article of food is almost universal, for all are dependent at least during the early stages of their extra-uterine existence upon this necessary and nutritious tissue builder. Among humans it has an established place upon the menu, in one form or another for nearly every meal, and is probably used more than any other single article of food.

Having such a general and world-wide use and coming from so many different sources and under circumstances as varied as the habits and environment of man himself, it is only natural that it should take its just share of the responsibility for carrying and harboring pernicious and otherwise objectionable organisms. In addition the filth and debris commonly found about the average premises where milk is produced may contribute generously to the total contents of the milking receptacle.

The very composition of milk is a factor that must be reckoned with in explaining the presence of the foreign content so often encountered in the examination of this commodity.

Being opaque it successfully veils any macroscopic material, other than that on the surface, which may enter it and again the natural constituents are of such a character that milk is one of the best culture media we know of for the growth and multiplication of bacteria. Many of these bacteria are harmless and desirable, in the case where souring is wished for, but too often these desirable ones are associated with certain others which are troublesome and often a menace to the health of the consumers, both human and animal.

The subject of infections borne in milk is a big one, and a lifetime might be spent investigating the subject and a volume written upon the results obtained. However, in the present paper we will not venture anything original, but will limit the subject to a review of the facts already known to most of us.

Veterinarians are mostly interested in the sanitation of the milk, of the cow for food purposes and the milk of the horse, sheep and swine as a contributory factor in harboring and spreading organisms which frequently cause much trouble in the mother and the new born.

One reason we so often find such bad milk, from the standpoint of cleanliness, is because the average consumer in selecting his milk supply usually asks "how cheap." If the price seems satisfactory he goes no further, but uses that milk regardless of the bacterial content or the condition of the animals which produced the fluid or the sanitation of the premises on which it was produced or the health of the attendants doing the work.

He is not concerned if the milker be a disease carrier with filthy personal habits upon whose unclean hands may be fecal contamination, which is sure to find its way into the milk if the milker, which is so often the case, squirts milk upon his hands in order to facilitate the action of the fingers upon the teats. Nor does the consumer care if the milker be a convalescent from scarlet fever or diphtheria or affected with pulmonary tuberculosis and practices the filthy and somewhat common habit of spitting upon his hands to moisten them preliminary to milking.

This is not a pleasant thought to associate with your breakfast food or with that glass of milk you drink every meal, but in a great many instances it is true, nevertheless, for these conditions do exist in some so-called first class dairies supposed to be selling clean milk.

These things all require consideration for the production of uncontam-

inated milk, and while it would not be practical for every consumer to make an investigaton himself, yet he owes it to his own health and the health of others who may use the milk he buys to see that dairy inspection is maintained.

Very few systems of inspection are perfect, we will admit, and some are no doubt very bad, but there is no arguing that any kind, no matter how bad, is better than none whatever.

If the average American was as particular about the milk he uses or allows his baby to use as he is about the brand of tobacco he smokes or the color of his neckties we would very soon bring the production of clean milk to a standard where the danger of milk borne infections would be reduced to a minimum.

When we take into consideration the conditions as found at the average dairy farm where milk is produced, we readily see that the opportunities for the contamination of the milk are many, and we wonder how we have escaped disease as long as we have. Only the fact that most of us have a natural immunity explains our good fortune.

The most noteworthy infections which may be borne in bovine milk are the following: tuberculosis, typhoid fever, diphtheria, scarlet fever, rabies, contagious abortion, and septic sore throat. It is well also to consider measles, smallpox and cerebro-spinal meningitis as likely to be disseminated by this agent.

The infection which commands our attention first as being of the greatest importance is that of tuberculosis. It used to be the accepted theory that this disease in the human could only be contracted by inhalation by way of the respiratory tract. Investigators have since shown that tubercle bacilli can and do penetrate the digestive tract and finally reach the lungs or perhaps spread throughout the whole body from the intestinal seat of entrance. Then again we have a great deal of evidence at hand to prove that tubercle bacilli entering the alimentary canal frequently find a favorable seat for multiplication and produce an intestinal or abdominal form of the disease.

When we consider the above route of entrance of the tubercle bacilli into the body we can readily see the danger in using milk from tuberculous cows or milk which has been handled in any way by persons affected with tuberculosis. This one disease alone should be argument enough for insisting upon clean milk.

Typhoid fever, which causes in the United States more deaths annually than any other epidemic disease, next commands our attention. In the spread of this disease milk is second only to water as a medium of dissemination, and is undoubtedly the principal means by which the infection is spread in cases where we find a safe and uncontaminated water supply.

We are taught that typhoid fever is usually spread by one or all of the four F's, namely, fingers, flies, feces, and food. Taking into consideration that typhoid is a disease of the digestive tract and that milk makes up a large part of the daily ration of the human race we see its importance as a source of dissemination for this common disease. To place milk production entirely out of reach of the factors comprising the above four F's, is at this time an impossibilty.

Here again we see the necessity of adequate sanitation in the handling of milk for food.

As to the spread of scarlet fever through milk the evidence is not as complete as one should have it in order to draw definite conclusions but from the results obtained by investigators who have studied the question, one is forced to believe that the etiological factor causing this disease is at least in some instances associated with the milk supply. More work is needed in this connection.

Since the Klebs-Loffler bacillus, the causative agent in diphtheria, readily proliferates in raw milk it is only natural to assume that milk which has been contaminated by the entrance of this organism should be a source of danger to the consumer. And such is the case, for in a large number of out-

breaks of diphtheria the source of the infection has been definitely traced back through the milk supply to persons suffering with the disease and in some cases to ulcers upon the cows' udders which had become secondarily infected with the diphtheria bacillus.

In connection with diphtheria it should be mentioned that epidemics of septic sore-throat have been traced to cows afflicted with udder eruption as well as to cows suffering from mastitis.

It should be necessary to warn against the use of milk from such animals at least until the pathological condition has been corrected by appropriate treatment.

In anthrax there is some argument as to whether the contagium is contained in the milk itself or if it is primarily in the blood which so often escapes from the udder in the course of this dreaded disease. It is needless to say that cows affected or suspected of being affected with anthrax should be at once isolated and left severely alone as regards milking them.

The spread of cowpox has but infrequently been traced to the milk supply but it undoubtedly does occur.

Milk from animals suffering from rabies is always to be considered of the greatest danger and should never be used under any circumstances.

Animals affected with hemorrhagic enteritis should not be allowed to supply milk for use because evidence tends to show that it may be a source of disease.

The highly infectious character of foot-and-mouth disease is proved by the fact that if calves be allowed to suckle affected cows, infection of the calves nearly always results. Milk from such animals should never be used as this disease is transmissible to man.

As to whether the milk of mares suffering from influenza will transmit the disease to the colt, more work is needed but what Hutyra and Marek say on this point, leads the reader to believe that the milk does contain the etiological factor of the disease.

In connection with infectious anemia in the horse we are not sure if the foal contracts the disease *en utero* or from the milk. Probably the conditions of the fetal life as well as the milk supply have each a contributory influence.

Lately a great deal has been written as to the part milk plays in spreading contagious abortion. W. L. Williams has done much work in this connection and has come to the conclusion that milk is the most important factor we have to deal with in the control of this troublesome disease. The experiments which he carried out to prove this fact are very convincing and certainly show the importance of dairy sanitation as well as the danger of feeding calves raw milk from cows which have not carried their calves the full length of time or from those which have reacted to the agglutination or the complement-fixation test for contagious abortion.

To feed milk from such cows boiling should always be practiced although for human use no ill effects will result from the use of the raw product so far as we know.

Regarding the part that milk may play in the transmission of hemorrhagic septicemia Hutyra and Marek say: "The blood is highly infectious in the latter stages of the disease and during this time the blood as well as the other body fluids and excrements may infect other animals, and in this way the enzootic may continue to spread in a contagious form."

The conclusion to draw from the above is that it is dangerous to use or allow to be used milk from animals suffering from this disease.

There are a number of other infections which may be carried through milk but the above mentioned are the important ones. While not a great many as to number yet they are responsible for a large share of the deaths in man and among the lower animals not to speak of the great economic losses to owners of live stock and the impaired health so often resulting in man even after apparent recovery.

A Brief History of Veterinary Medicine*

By HOWARD A. O'BRIEN, Manhattan, Kansas. Kansas State Agricultural College, Class of 1918.

THERE is evidence that the Egyptians practiced veterinary medicine and surgery in very remote times, but it is not until we turn to the Greeks that we obtain any very definite information with regard to the state of veterinary medicine in antiquity. The writings of Hippocrates (460-337 B. C.) afford excellent evidence of investigations in comparative pathology. Diocles, who was nearly a contemporary, was one of the first to occupy himself with anatomy which he studied in animals. Aristotle, too, wrote on physiology and comparative anatomy. Mago of Carthage (200 B. C.) wrote 28 books pertaining to branches of the science which were translated into Greek.

The Romans learned veterinary medicine after the conquest of Greece. Varro (116-28 B. C.) was probably the first Roman writer who dealt with animal medicine. His De Re Rustica, in three volumes, was largely derived from Greek writings. However, the most renowned veterinarian of the Roman Empire was Apsyrtus of Bithynia, who in 322 A. D. went with the Roman army in an expedition of Constantine against the Sarmatians, in his professional capacity. He was a keen observer: he distinguished and classified a number of diseases; he recognized the contagious nature of glanders, farcy and anthrax, and prescribed isolation for their suppression. He recommended splints for fractures, sutures for wounds, cold water for the reduction of a prolapsed vagina, hot baths for tetanus, etc. Others of this time recognized aërial infection, utility of disinfectants, wrote descriptions for operations, and the like.

In the middle ages veterinary medicine was utterly neglected. Terrible plagues swept away entire herds and flocks in many countries just as the great epidemics of the middle ages swept away vast numbers of human beings, almost depopulating many provinces of Europe. Indeed cattle plagues were not infrequently the forerunners of great epidemics and although they may have had no connection as cause and effect they may have had some corelation in affecting the food supply of human beings, ushering in periods of famine which added intensity to epidemic diseases. Veterinary medicine became again somewhat of a study when the Constantine collection of works were translated from the original Greek into Latin by order of Francois II. Soon afterwards translations were made into Italian, French, and German.

At the close of the medieval period the subject was much cultivated in cavalry schools of Italy. Spain organized a system of good practitioners in the middle of the 13th century. Germany was far behind and any writing on the subject did not appear until the end of the 15th century, when in 1492 there was published at Augsburg a *Pferdearzneibüchlein*. A work on comparative anatomy by Volcher Koyter was issued at Nuremberg in 1573. About the same time a German writer published a book on the anatomy of the pig, in which he made several original remarks on lymphatic vessels. English books of the 17th century exhibit a strong tendency towards improvement of veterinary medicine and surgery, especially as regards the horse. This is even more notable in the writings of the 18th century among which are Gibson's Farrier's New Guide (1719), Method of Dieting Horses (1721) and his New Treatise on Diseases of Horses. At about the

*Awarded first prize, $20.00 worth of books, in the *American Journal of Veterinary Medicine* Students' Essay Contest, for 1917, at the Kansas State Agricultural College.

same time, Snape, farrier to Charles II, advanced the science by The Anatomy of the Horse, illustrated with copper plates.

The most important era of veterinary science began with the institution of modern veterinary schools. France first instituted such a school under the direction of Claude Bourgelat (1712-1799) at Lyons, France, in 1761. Similar schools were soon placed in several parts of France. Bourgelat founded one at Alfort, near Paris, in 1776, which is today one of the finest veterinary schools in the world. One of the early brilliant students of the school at Lyons was Gilbert, who later became head of the department of veterinary medicine and surgery. His wide knowledge made him very useful to France during the French Revolution. The Alfort school became the source from which all similar schools obtained their teachers and guidance. The third great French school was founded in 1825 in Toulouse and these three schools have produced thousands of thoroughly educated veterinary surgeons and many noted professors among whom may be named Bouley, Chauveau, Colin, Toussaint, Neumann and others.

The opening of the Alfort school in France was followed by the establishment of several other schools: in Italy, (Turin, 1769), Denmark, (Copenhagen, 1773), Austria (Vienna, 1775), Saxony (Dresden, 1776), Prussia (Hanover, 1778; Berlin, 1790), Bavaria (Munich, 1790), Hungary (Budapest, 1789) and in Spain (Madrid, 1793). Soon government schools were founded in nearly every European country except Great Britain and Greece. Most schools, especially those of France and Germany were founded with the view to training veterinary surgeons for army service. In 1907 France had three national veterinary schools, Germany had six, Russia four, Italy six, Spain five, Austria-Hungary three, Switzerland two, Sweden two, Denmark, Holland, Belgium and Portugal, one each. The veterinary schools of Berlin, Hanover and Vienna have been raised to the position of universities.

In 1790 St. Bel, after studying at Lyons, founded the veterinary college of London. This was a private institution of which he was professor of veterinary medicine and surgery. The school throve and has produced several noted men who have gained celebrity as veterinarians. The London veterinary college received grants from the Royal Agricultural society which helped very greatly to build it up and put it on a firm basis. The London veterinary college is the parent of several other schools the first of which was established in Scotland. In 1906 the University of London instituted a degree of veterinary science (B. SC.). In 1844 the Royal College of Veterinary Surgeons obtained a charter of incorporation. The function of this body until 1881 was to examine students of other veterinary colleges and grant diplomas of membership to those who successfully passed the examinations conducted by the board which sat at London and Edinburgh. The holder of a diploma granted by this board was considered a member of this body. Now, all students of England, Ireland and Scotland must pass the examination given by the board before they can practice veterinary medicine. In the English army (as well as in this country) a veterinary surgeon ranks as a second lieutenant, possible promotions include the rank of general and in this country the rank of major. British army service was first instituted in the 19th century. In 1907 the English army veterinary corps consisted of 167 officers and 220 noncommissioned officers and men.

Veterinary science made very slow progress in the United States until 1844, when the Bureau of Animal Industry was established at Washington, D. C. In 1907 the bureau consisted of ten divisions, employing the services of 815 veterinarians. At present it includes 1,225 veterinarians and it is expected that 500 will be added to this number during the present summer. The bureau deals with the investigation, control and eradication of contagious diseases of animals, the inspection and quarantine of live stock,

horse-breeding, experiments in feeding, diseases of poultry and the inspection of meat and dairy produce.

In the United States veterinary medicine is taught chiefly in private institutions, though some state institutions have departments devoted to the science. Among the first American veterinary schools to be established were one at New York City in 1848, Boston in 1848, Chicago in 1883, and later one at Kansas City. These were all private institutions. The American Veterinary College of New York, founded in 1875, is connected with the New York University and the New York State Veterinary College forms a department of Cornell University at Ithaca. Other veterinary schools attached to state universities or state agricultural colleges are those at the university of Pennsylvania; the university of Ohio; The Iowa State College; Washington State Agricultural College; The Alabama Agricultural and Mechanical College; The Kansas State Agricultural College; The Colorado Agricultural College; The Georgia Agricultural College; and the Texas College of Agriculture and Mechanic Arts. There are also veterinary colleges (private) located in San Francisco; Washington, D. C. (two); Grand Rapids, Michigan; St. Joseph, Missouri; Cincinnati, Ohio; Indianapolis, Indiana, and Terre Haute, Indiana, in addition to the earlier established private veterinary colleges mentioned above.

With a very few exceptions, the courses offered in the schools of this country are four years in length, four school-years being required to complete the course after graduation from an accredited high school. Such rapid strides have been made in the advancement of the science that graduates in veterinary medicine take their place alongside of doctors of human medicine as trained men and as professional men.

The Economic Importance and General Prevalence of Periodic Ophthalmia*

By W. J. MARTIN, V. S. Kankakee, Ill.

THE financial loss from this disease is large. This is mainly due to the fact that the disease as a rule strikes the animal at the very beginning of its period of usefulness, that is at from two to five years of age. In agricultural districts the majority of the cases are first noticed shortly after they have been broken to harness and put to field work. This is in part no doubt due to the change in the animal's environment, change of diet, heavy grain feeding and hard work. The hereditary taint being in the animal's system is brought rapidly or slowly forward according to the care the animal receives in its work and housing. If the work is of a hard and exhausting character, the weather hot and dusty, the animal stabled in a dark or illy ventilated stable, the attack will be as a rule severe. Perhaps the animal may be rendered blind in a short while. On the other hand, if the animal is lightly worked, well fed and housed, permanent blindness may be deferred for several years.

It is no less than a misfortune for a man to raise a colt up to serviceable age and then have the animal go blind. He has spent his time and money in vain in producing an article that is a liability instead of an asset. With land and feed at top prices, it costs a considerable amount of money to raise a colt up to a workable or salable age and the loss is practically total when that animal goes blind from ophthalmia.

The evils of this disease are many and ramifying. I will cite a few. An enterprising stockman who is a lover of good horses may decide to purchase a good pure-bred stallion colt,

*Presented at the semi-annual meeting of the Illinois State Veterinary Medical Association, Peoria, Ill., July 19, 1916.

one that he thinks will soon develop into a first-class breeder, an animal that will not only produce good stock but yield a reasonable return on the money invested and the care involved. What a disappointment it must be to such a man, to say nothing about the financial loss, when he finds his handsome animal is doomed to blindness on account of ophthalmia!

In my opinion there is no more important operation in our profession than the examination of stallions for soundness, especially young ones. We should not only make a careful examination of such animals, but we should endeavor to trace back as far as possible, the ancestry of each one. Too large a number of stockmen ignore the service of the veterinarian in the purchase of live-stock and often become the victims of their over-confidence at the hands of unscrupulous dealers. I have more than once known the purchaser of blooded stock to get scarcely more than "blue sky" for his hard earned dollars because he did not deem it worth while to employ a veterinarian to aid him in the selection of an animal. The lone individual blooded-stock-buyer, especially of stallions, should ever bear in mind that old Roman adage, *caveat emptor,* and also the fact that bad eyes mean no license and that no license means no stallion.

While on this subject, I wish to call the attention of our stallion registration board to the fact that the law under which they are working went into effect January 1, 1910. Since that date there has been no reëxamination of the majority of the stallions registered since that time. How many of these stallions have become affected with periodic ophthalmia or other transmissible diseases in the past seven years?

It appears to me that our stallion law is sadly in need of revision. I believe that a stallion should be examined every year before he should have his previous license renewed. It is a well known fact among veterinarians that many stallion colts coming two years old are examined for license each year. Such animals may be perfectly sound at the time of the examination so far as it is possible for the examiner to ascertain, yet a number of them in the course of a year develop periodic ophthalmia that ultimately leads to partial or complete blindness. What is the outcome of such cases? If the animal is only partially blind, the owner will certainly not remove him from service. The neighbors of the stallion owner are, as a rule, unwilling to report the case to the stallion board, and the upshot of the matter is that the horse keeps on propagating his hereditary taint. This illustration applies not only to ophthalmia, but to the other scheduled hereditary diseases as well. All of you no doubt could cite similar cases. The remedy for this untoward state of affairs, is reëxamination.

In advocating a revision of our present stallion law the charge of self-interest on the part of the veterinary profession will no doubt be made by those who are opposed to any change in the present law. On this point it should be borne in mind, that but rarely has there been any changes made in existing laws of a state or nation but that the same charge has been made, that it was done in the interests of, or at the behest of, certain privileged classes. It is to the interest of every horse raiser of this state to have the law revised and the horse raisers of this state are by no means few in number but represent in the aggregate a large proportion of the wealth of this state.

A peculiar characteristic I have noticed about ophthalmia is its tendency to skip over one or more generations of horses and break out again. For instance, the sire or dam of a foal may be affected with the disease and yet the colt may escape the disease entirely during its lifetime and yet be the medium for transmitting the disease to its offspring. I have known this to occur more than once, and in some instances the disease would have to be traced back several generations before its appearance in an otherwise sound animal from sound parents and kept in ideal surroundings, could be accounted for. Of course, bad environment or unfavorable climatic conditions will naturally hasten the appearance of the disease where the hereditary taint already ex-

ists. Another important factor to remember in connection with this disease is, that in no living vertebrate animal, man not excepted, is there such a strong hereditary characteristic or idiosyncrasy for the transmission of constitutional diseases and anatomical variations as we find in the equine species.

General Prevalence of the Disease

Periodic ophthalmia is a disease of wide prevalence. It exists in practically all parts of the United States, but prevails most extensively in swampy, low lying or undrained lands. It is seldom met with in high latitudes, especially if the air is dry. In the central states of this country the draining of the land and the erection of better farm buildings have in a large measure eradicated the disease. In the district in which I now live, "moon-blindness" was to be seen on nearly every farm forty-five or fifty years ago. Today, while occasionally met with in practice, the disease is by no means common. When a case is now found on a farm, you will almost invariably find that there is something wrong with the regime of that farm. Either the work of the animal has been of an exhausting nature, the food of poor quality or insufficient in quantity, or the surroundings unhygienic, or perhaps all of these conditions may be present.

It is astonishing what a high value seems to have been placed by so many farmers on window-glass when they were building their barns. You would naturally be led to think that window-glass was both high in price and scarce in quantity. The reverse of this is true. Window-glass is about one of the cheapest articles that can be used in the construction of a building. There are few of us that have enough of sunlight, either in our homes or stables. As a prophylactic against disease, there is no disinfectant as good as sunlight and fresh air. Our slogan to the farmers should be "more sunlight in the barns." Nothing, not even "war baby" stocks and bonds, will in the long run pay the farmer so large a dividend as will window-glass for his farm buildings.

Cases of ophthalmia will once in a while be found in the best of buildings in which an abundance of light and air is present. When such is the case, you can as a rule make up your mind that it did not originate on the premises, but was undoubtedly brought in by purchase or is due to a hereditary taint.

An investigation made by me during the past few years as to where the largest number of cases of periodic ophthalmia are found, showed that by far the largest number of cases were found on farms that had long been subjected to the "short-lease" system of tenant farming. The "short-lease" system means that a tenant is not permitted to remain on a farm longer than one year, unless he is able to stand the landlord's annual rent-raise each year. The result of such a system is a procession of moving tenants each spring. On such tenant farms, the buildings as a rule have been allowed to fall into more or less of a dilapidated condition by the absentee landlord. On some such farms, you would think, owing to its scarcity, that window-glass was worth as much as radium. On such farms are to be found the majority of the cases of periodic ophthalmia.

The next most common place to find the disease was on farms that were owned and operated by family heirs or their descendants for several generations. The methods of carrying on farming on many such farms is generally on the hit-or-miss plan; that is, of never doing anything today that can be put off until tomorrow. By a slow process of dry rot, the buildings of such a farm, that perhaps were built fifty or sixty years ago when no ideas prevailed as to sanitary measures, have never been remodeled or even kept in a decent state of repair. I have seen some such buildings without a single window. The old cellar or side-hill barn is a good illustration. Such types of barns are common in old settled communities and the owners seem to lack the required energy or enterprise to break holes through the buildings' massive walls and let in the sunshine. In such buildings it is nothing uncom-

(*Continued on page* 562)

AMERICAN JOURNAL of VETERINARY MEDICINE

Published Monthly by
AMERICAN VETERINARY PUBLISHING CO.,
9 So. Clinton St., Chicago

Entered as second-class matter, July 10, 1910, at the postoffice at Chicago, Illinois, under act of Congress of March 3, 1879.

GUARANTEED PAID CIRCULATION OVER 8,500 MONTHLY

Address all communications to the AMERICAN JOURNAL OF VETERINARY MEDICINE, 9 South Clinton Street, Chicago, U. S. A.

Subscriptions from the United Kingdom should be sent to our London office in care of Messrs. Bailliere Tindal & Cox, 8 Henrietta Street, Covent Garden, London, England.

Fifty-Fourth Annual Meeting of the A. V. M. A

THIS momentous period of history that means so much to the future of America and world democracy, is also of special significance to the veterinary profession, and a meeting of our national organization, while always an important event, takes on at this particular time an unusual air of solemnity and consequence. For this reason, all veterinarians whether members of the association or not, should make extraordinary efforts to attend the gathering at Kansas City, August 20th to 24th. They should feel that it is not only of personal benefit but a duty to the country for them to be present at the deliberations of this body when it convenes at this perhaps the most solemn hour in the destiny of our nation.

The place of meeting being at Kansas City provides a central location, so that veterinarians from all parts of the country may attend without undue expense in the matter of railroad fares. The headquarters will be at the Muehlebach Hotel, 12th and Baltimore Streets, and the sessions held at the Kansas City Veterinary College, which has ample facilities to accommodate a large audience. An extensive program of surpassing merit has been prepared, which cannot fail to be of interest and instruction to every one attending.

The veterinarians of America are invited, welcomed and urged to be present, and as befits the times, set a new record for attendance at this meeting of the A. V. M. A., making it the occasion for the largest assemblage of veterinarians ever gathered together at one place. Come.

PROGRAM

August 17th and 18th.

Meeting of the Executive Board.

August 20th.

9:30 a m. Opening exercises in the college auditorium.

12:00 m. Luncheon at the college.

1:30 p. m. First session of the Section on Sanitary Science and Police, of the Section on Surgery and Practice and of the Association of Faculties and Examining Boards.

8:00 p. m. Meeting of the alumni associations.

August 21st.

9:30 a. m. Second session of the Section on Sanitary Sscience and Police and of the Section on Surgery and Practice.

12:00 m. Luncheon at the college.

1:30 p. m. General business session including the election of officers.

8:00 p. m. Reception at the Muehlebach Hotel.

August 22nd.

9:30 a. m. to 5:30 p. m. Pathological exhibit and luncheon at Armour Packing Co.

August 23rd.

9:30 a. m. Third session of the Section on Sanitary Science and Police and of the Section on Surgery and Practice, and the election of the session officers.

12:00 m. Luncheon at the college.

1:30 p. m. Joint session.

7:30 p. m. Annual banquet at the Muehlebach Hotel.

August 24th.

9:30 a. m. General session for unfinished business and clinic until 4:00 o'clock p. m.

A Drive in Roanoke Park. This view is representative of the magnificent scenery along the extensive boulevards of Kansas City. This particular scene is not far from the historic Santa Fe Trail.

Literary Program

Monday, August 20th, 1:30 p. m.

Section on Sanitary Science and Police, (Auditorium)

1. Chairman's address, J. G. Willis, Albany, N. Y.
2. Secretary's report, T. Edward Munce, Harrisburg, Pa.
3. Tuberculosis of Cattle, H. W. Turner, Harrisburg, Pa.
4. The Advantages of Testing Pure Bred Herds, S. H. Ward, St. Paul, Minn.
5. Some of the Problems in the Control of Tuberculosis of Animals, Jacob Traum, Berkeley, Calif.
6. The Reliability of the Tuberculin Test C. J. Marshall, Philadelphia, Pa., and H. W. Turner, Harrisburg, Pa.
7. Discussion on tuberculosis, by Drs. V. A. Moore, O. E. Dyson, A. S. Cooley, George Hart and D. F. Luckey.

Section on Surgery and Practice, (Room B)

1. Chairman's address, T. H. Ferguson, Lake Geneva, Wis.
2. Secretary's report, J. H. Blattenburg, Lima, Ohio.

3. Coital Exenthema, Hal. Simpson, Denison, Iowa.
4. Sterility of Mares, F. F. Brown, Kansas City, Mo.
5. The Abderhalden Test for Pregnancy in Animals, C. A. Zell, Abbott Laboratories, Chicago, Ill.
6. Mastitis, W. A. Axby, Harrison, Ohio.

Tuesday, August 21st, 9:30 a. m.

Section on Sanitary Science and Police.
(Room B)

1. Vesicular Stomatitis, J. R. Mohler, Washington, D. C.
2. Anthrax, R. C. Reed, Department of Agriculture, Maryland; Discussion by W. H. Dalrymple, Baton Rouge, La.
3. Studies of an Obscure Cattle Disease in western Nevada, W. B. Mack, Reno, Nev. Discussion, A. T. Kinsley, Chas. Lamb.

Section on Surgery and Practice.
(Auditorium)

1. Osteopathy in Veterinary Practice, E. A. A. Grange, Toronto, Ont.
2. Heat Stroke, Its Complications and Treatment, Rubin Hilty, Toledo, Ohio.
3. Digestive Disorders of Cattle, D. H. Udahl, Ithaca, N. Y.
4. Intussusception in Horses and Colts, John F. DeVine, Goshen, N. Y.
5. Some Original Methods, Instruments and Operations, Wm. M. Bell, Nashville, Tenn.

Thursday, August 23rd, 9:30 a. m.

Section on Sanitary Science and Police.
(Room B)

1. Some Observations on Hog Cholera and the Use of Serum, Drs. Stange, Murray and Cole. Discussion by J. W. Connaway, R. A. Craig and E. A. Cahill.
2. Regulation of the Production and Sale of Biological Products, by the Bureau of Animal Industry, J. R. Mohler and A. R. Ward. Discussion by John Reichel, Frank Breed and T. F. Krey.
3. Studies in Blackleg Immunization, Adolph Eichhorn, Pearl River, N. Y. Discussion by L. W. Goss.

Section on Surgery and Practice.
(Auditorium)

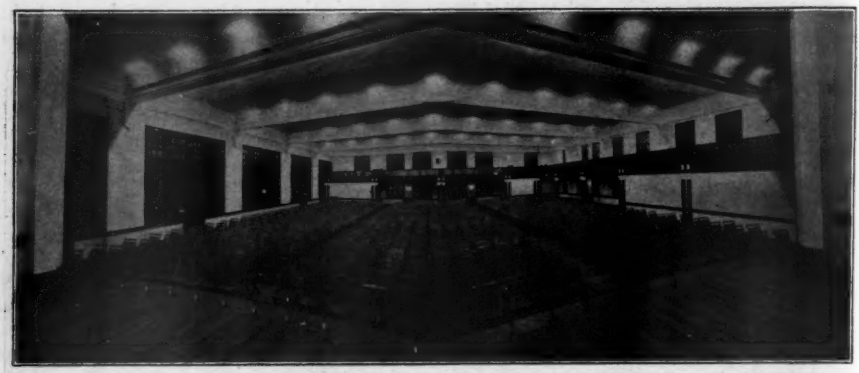
1. Serum Treatment of Canine Distemper, A. Slawson, New York, N. Y.

Two of the three buildings of the Kansas City Veterinary College. The building in the distance is the auditorium where all of the literary program of the A. V. M. A. is to be held.

2. The Handling of Dogs in a Veterinary Practice, Arthur Trickett, Kansas, City, Mo.
3. Diseases of the Feet, An Illustrated Lecture, H. S. Murphy and H. E. Bemis, Ames, Iowa.
4. The Distribution of the Median Nerve and the Lameness in Horses Benefited by its Resection, Joseph Hughes, Chicago, Ill.
5. (Title not announced) W. B. Mack, Reno, Nev.
6. General discussion opened by L. Enos Day, Chicago, Ill.

Friday, August 24th
Clinic Program.

1. Securing cows for udder operations, J. P. West, Madison, Wis.
2. Surgical treatment of sterility, W. L. Williams, Ithaca, N. Y.



Convention room in the auditorium of the Kansas City Veterinary College. This room has a seating capacity of 1,500.

5. Abortion Disease, W. L. Williams, Ithaca, N. Y. (Both sections participating).

Thursday, August 23rd, 1:30 p. m.

Joint Session.

Symposium on Animal Parasites.

(Auditorium)

1. Parasites of Swine, W. Lester Hollister, Avon, Ill.
2. Parasites of Sheep, A. D. Knowles, Missoula, Mont.
3. Parasites of Cattle, Seymour Hadwin, Agassiz, B. C.
4. Parasites of Horses, C. P. Fitch, Ithaca, N. Y.
3. Operation for roaring in horses, John Adams, Philadelphia, Pa.
4. Special procedure against sidebone, L. Hart, Chippawa Falls, Wis.
5. Hernia operations, George B. McKillip, Chicago, Ill.
7. Extraction of molars under "nerve blocking" anesthesia, H. E. Bemis and L. A. Merillat.
8. Operation for obstruction of the teats of cows, T. H. Ferguson, Lake Geneva, Wis.
9. Operation for fistula of the withers, H. E. Bemis, Ames, Ia.
10. A new operation for recto-vaginal fistula, R. C. Moore, St. Joseph, Mo.

Let every man be occupied, and occupied in the highest employment of which his nature is capable, and die with the consciousness that he has done his best.—Sidney Smith.

Do not think that what is hard for thee to master is impossible for man; but if a thing is possible and proper to man, deem it attainable by thee.—Marcus Aurelius.

ON THE USE OF IODIN IN THE TREATMENT OF PNEUMONIA

The articles by Captain Gregg and his assistants which appear in this issue should stimulate interest in further study of the treatment of pneumonia of the horse. No one who has been treating pneumonia, where it occurs as a complication of infectious catarrhal fevers, and experiencing the usual, large percentage of losses in such cases, will fail to notice the remarkable showing that is indicated in the tabulated report—a loss of only 13 animals in the treatment of 120 cases wherein 17 cases were considered hopeless at the outset.

In the light of past experience in the treatment of pneumonia, many veterinarians have come to look upon this disease as an infectious process wherein good nursing and the judicious use of suitable stimulants constitute the essential part of treatment; that the frequent administration of medicaments tend to do more harm than good. In some cases frequent medication has been productive of actual harm, chiefly because the effects of the drugs employed were not beneficial, and the repeated annoyance of the subject caused distress and depression. In other instances, the administration of depressants have occasioned harm, and likewise, large, oft repeated doses of heart stimulants have resulted in reactionary depression. It is no wonder then that many practitioners are of the opinion that little good comes from medication in pneumonia cases in the equine subject.

During recent years much experimentation has been done in the employment of biologic preparations for the treatment of pneumonia and, in consequence, opinion is divided regarding the character of the results that we are to expect from such therapeutic measures. For example, the administration of bacterins in cases wherein hyperthermia is directly due to the absorption of products of pus-producing organisms, when such bacterins are largely the products of similar organisms, is, according to the views of some careful observers, irrational practice. Nevertheless, hundreds of veterinarians employ such methods and report beneficial results therefrom. The writer cannot endorse the theory, but being of the opinion that it is irrational practice and having, therefore, no clinical evidence from his own experience that would support his views, must, perforce, accept the reports of others whose views are based upon clinical observations.

The introduction of toxic substances into the economy of a subject that is already intoxicated from products similar to those introduced (for curative purposes), it seems, must be a goad that precipitates a crisis and suddenly marshals all of the reserve defensive forces of the host, and, if resistance is great or the attacking disease-producing agencies comparatively weak, recovery is hastened.

Agents having the quality of supplying material that is in itself directly antagonistic to the disease-producing organisms or their products (antitoxins), do not draw upon the defensive powers of the patient when employed during the acute stage of an infectious disease. Diphtheria antitoxin furnishes an example of such an agent, and there is almost unanimity of opinion as regards the results that one may expect from its use.

When, however, an intoxication results from heterogeneous organisms or from unknown or ultra-microscopic agencies, and clinical results in the handling of such cases indicate that usual treatment is very unsatisfactory, any change in the method of treatment that is the means of a much greater percentage of recoveries in the handling of such cases, ought to be extensively employed by practitioners at every opportunity.

With the intravenous introduction of soluble iodin, according to the methods described in the article heretofore cited, there is promise that this will mark an epoch in the handling of many infectious diseases. Iodin is an agent which possesses peculiar properties that have made it a valuable drug in the treatment of many diseases. Its specificity in actinomycosis, its markedly favorable action in syphilis, its incomparably practical and beneficial effects, locally, in the treatment of infected wounds, have served to keep it in the foreground among myriads of therapeutic agents in an age of

medical fads. This, it seems, should be reason enough, with the clinical evidence offered in the dissertation of Captain Gregg and his assistants, to stimulate practicing veterinarians to employ iodin intravenously, not only in certain pneumonias but in other infectious diseases, and possibly it might be advantageously employed in larger doses.

J. V. L.

BOOK REVIEW

MICROBIOLOGY. A Text-Book of Microörganisms, General and Applied. Edited by Chas. E. Marshall, Professor of Microbiology and Director of Graduate School, Massachusetts Agricultural College, Amherst, Mass.

The favorable reception accorded the first edition of this book caused Professor Marshall with the collaboration of twenty-five contributors to thoroughly revise it and publish a second edition. This has been accomplished in a most commendable manner.

The book answers a great want in the list of text books, such as no other offers. Students of veterinary medicine, agriculture, domestic science and human medicine will find a vast quantity of valuable information incorporated in "Microbiology," information that will assist in interpreting the phenomena occurring in air, sewage, soils, dairy products, fermentation, food preservation and decomposition, manufacture of biological products, transmission of diseases, sanitation, immunity, control of infectious diseases and a host of other features that are of every day importance and interest.

The fact that the various subjects have been discussed by twenty-six different men, each an authority in his chosen work, stamps this book as one from which authentic information can be obtained. The authors have brought all the subject matter up to date so that it is abreast of the times in all respects. There are 186 illustrations, an increase of 58 over the first edition. The number of text pages has also been increased from 724 in the first edition to 900 in the present edition. As comprehensive as this book is, comprising 49 chapters and containing some 250 to 300 more pages of subject matter than other works composed of fifty chapters, it nevertheless is compactly bound into a conveniently sized volume.

Cloth bound; price, $3.00. P. Blakiston's Son & Co., Philadelphia.

A. A. Leibold, D. V. M.

BULLETINS OF INTEREST TO VETERINARIANS

State of Nevada Biennial Report of the State Board of Stock Commissioners, 1915-1916

The greater part of this report is occupied by an account of the veterinary activities of the state of Nevada in the recognition and control of infectious diseases in animals, which has been prepared by Dr. W. B. Mack, Director of the State Veterinary Control Service. Excluding rabies, the report states there were no serious losses from acute infectious diseases, except in one outbreak of hog cholera, during 1915-1916. Vaccination is credited with having given very good results in the prevention of anthrax, blackleg and hemorrhagic septicemia. Contagious epithelioma and cholera are mentioned as having been prevalent among poultry in several localities. Rabies, which is said to have made its appearance in the state in April, 1915, has since involved large areas, its spread being aided by the presence of the infection in wild coyotes. The federal government came to the aid of the state in fighting the disease, and during the period covered by the report, it is estimated that 45,000 to 50,000 coyotes were killed in an effort to check the epizootic. This work is still being continued. Regarding the relation of the state veterinary service to the private practitioner, Dr. Mack has the following to say: "In our work in the suppression of outbreaks of infectious diseases, we sometimes perform services which otherwise would go to the practicing veterinarians. However, these men realize with us that that group of diseases will never be controlled through the medium of the private practitioner, and while they feel that on account of the activities of the state through this department they lose some business, they accept the situation cheerfully. On the other hand, we do no medical, surgical or obstetrical work, referring such cases to the practicing veterinarians. One or two ranchers have expressed dissatisfaction with our refusal to handle medical and surgical cases, but an explanation that the state properly makes no provision for such work, has served to satisfy this criticism. There is no adequate reason why the state should provide for the latter class of service."

(*Continued on page* 530.)

Queries and Answers

The editors will reply to queries appearing here, as they are able and as opportunity permits, but they do not want, nor cannot undertake to monopolize this portion of the department. Any reader who can furnish further and better information in reply to any query is urgently requested to do so. Where the treatments advised in these replies is adopted it is hoped that those employing them will report their results whether good or bad. In all cases give the number of the query when writing anything concerning it.

QUERY No. 314—Can you advise a remedy to promote the flow of milk in brood mares? What is the cause of this condition?—C. T.

REPLY BY DR. J. F. DE VINE: I take it that the question refers to mares that are not what might be termed good milkers, that is the glands functionate, there is no mammitis or atresia. If this is the case there are many things that will influence the milk flow; ill-health of any kind, debility, emaciation or certain specific diseases that might cause a wasting of the gland, but it is most often due to an insufficient or improper food supply; true it is that some cases occur where no logical cause can be attributed. The treatment is largely dietetic, giving plenty of proteins and laxative foods, oats, bran, alfalfa hay; also succulent foods, grasses, carrots, etc. It is well to salt all food rather liberally and so promote the drinking of a large amount of water for at least a week or ten days. Massaging the udder frequently, rubbing in a little olive oil is of more importance than is usually supposed. Jaborandi in some cases seems to be a useful drug.

QUERY No. 315.—I have in my care a thirteen-month-old Hereford heifer that has a partial prolapsus of the vaginal wall. She is very fat and quite large for her age. When she lies down, there appears a mass of protruding vaginal wall, which extends about two and one-half inches beyond the vulvar lips. When she stands, this slips back into position, and there is then no evidence of the condition. The heifer is in good health and there is no straining because of this local disturbance, but a slight muco-purulent discharge issues from the vagina. The condition has been noticeable for about ten days. This is a registered animal, quite valuable, and I should appreciate anything that you can offer in the way of suggestions for treatment that would prove helpful. J. L. W.

REPLY, BY J. V. LACROIX: From your description of this case, I take it for granted that this heifer has been finished for show purposes or that if the object has not been to show her, she is in a fit condition for such purposes. These cases are of frequent occurrence in beef cattle, but the condition is seldom observed before the heifers are about two years of age. The condition bears no relation to pregnancy, affecting the non-pregnant animals as well as the pregnant. It seems to be due in part, at least, to the unusual intra-abdominal pressure that exists in these animals. Because of the manner in which they develop, owing to the diet and care they receive, large quantities of fat are deposited in the areolar tissue of the perineal region, and this tissue is not sufficiently strong to prevent displacement of the parts, particularly when there is increased pressure such as occurs during recumbency. Because of the changed relations so occasioned, with every movement there occurs attrition upon certain parts of the vaginal wall. Irritation so occasioned results in vaginitis, sub-mucous extravasations, and, in time, a large tumefaction results. The mucosa overlying the more exposed parts of these protruding masses becomes necrotic, and eventually extensive sloughing takes place. Discharges are at first muco-purulent and finally contain detritus and even blood. As soon as these tumefactions attain considerable size, they are no longer hidden from view when animals are standing but occupy a position between the vulvar lips and in some cases protrude constantly, and because of this exposed position, extensive destruction of tissue occurs. Animals strain frequently and violently, the contiguous structures become congested and swollen, and in some cases death results from septic intoxication.

If it is expected that this heifer is to be used for breeding purposes, I should advise that she be so dieted that a marked reduction in weight will occur soon. Treat the affected parts by means of local injections of such agents as one-fifth of one per cent of lysol in tepid water, or if the parts should become so inflamed that considerable strain-

ing results, daily applications of an ointment containing tincture of opium and one-half of one per cent phenol should be made over the entire surface of the affected area. When these cases become chronic and aggravated, correction is almost impossible as long as the subject remains excessively fat. Surgical removal of the protruding mass may be successfully practiced when the conditions are favorable, though probably more failures than successes have resulted from this treatment. Some show cattle herdsmen make use of small bull rings, which they insert through the vulvar lips, joining them together in a manner that prevents prolapsus of tumefied portions of the vaginal wall such as marks the early stages of these affections. The rings are left in position permanently and do not seem to interfere seriously with the well-being of the subject.

QUERY No. 316—I should like to know from some one who knows if spaying a milk cow that is a non-producer should cause her to continue to give milk the year round for years to come.—R. L.

REPLY BY DR. T. H. FERGUSON: Spaying a cow shortly after parturition or while she is on full milk flow will prolong the flow for two years or more; providing she is fed a milk producing diet. It would be well to determine what causes the sterility in this case. It might be amenable to treatment.

QUERY No. 317—The February number had a long and interesting account of contagious abortion, which is from a scientific point of view no doubt very interesting to the country veterinarian, but to the city man who has his milk sent to him in bottles, who is led to believe the greatest source of milk supply is the mixing machine in a milk plant and who is trying to give to the public in large cities a pure food supply, one thought arises—if abortion bacilli are commonly found in the udder and are transmitted from there, is this a safe food for pregnant women who are by their doctors' orders using milk, eggs, etc., to build up a strong constitution for the expected event? Has any investigation been done along this line to find out whether this milk should be allowed to be sent into cities as a food for the human animal who is trying to obey nature's law and multiply, or is this milk from cows showing a reaction of abortion an unsafe product for the human race and should city health boards take it up and put a quarantine against all such known herds?—F. A. C.

REPLY BY DR. C. J. MARSHALL: Investigations have thus far failed to show that abortion disease of cows may be transmitted to the human female, through the medium of milk or otherwise. Blood specimens from women and children have given positive reactions to the complement-fixation and agglutination tests, but this may be due to an active or passive immunity. The fact that B. abortus has been recovered from inoculated guinea pigs indicates that it may be pathogenic to humans. The work of various investigators failed to show that adenoids and diseases of tonsils in children were due to this organism. We know that it produces a specific disease in cattle and lesions of a serious character in experimental animals. While we do not know its effect on human beings, it is reasonable to regard it with suspicion and add it to the chain of evidence to prove that the milk supply for human food should be pasteurized.

BULLETINS OF INTEREST TO VETERINARIANS

(*Continued from page 528.*)

Turkey Raising

BY ANDREW S. WEIANT, WASHINGTON, D. C.

Bulletin 791, Bureau of Animal Industry, United States Department of Agriculture. The number of turkeys in the United States is said to be decreasing. The census of 1900 showed 6,594,695 turkeys in this country, while by 1910 the number had diminished to 3,688,-708. This is in part explained by the growing lack of range conditions as the population increases and farming becomes more intensive. Attempts to raise turkeys in confinement have not proved successful. Where the conditions are favorable, however, turkey raising is said to be a profitable side line. Six varieties of this bird are recognized by the American Standard—the Bronze, White Holland, Bourbon Red, Black, Narragansett and Slate. The Bronze turkey is the heaviest and, therefore, the most popular variety among breeders as the greatest market demand is for heavy birds. In the selection of breeding stock, it is advised that birds be chosen for vigor, size, shape, strong bone, early maturity and color of plumage. The high mortality among young poults, which is very common, is attributed to some of the following causes: exposure to dampness and cold; improper feeding; close confinement; lice; predatory animals; weakness in the parent stock. The diseases discussed as more or less common to turkeys are, blackhead, chicken pox, roup, lice, limber neck and impaction of the crop. It is stated that blackhead is the most destructive, but that where climate and range conditions permit the turkeys to forage for most of their feed from the time they are hatched until marketed, the disease is less prevalent than otherwise.

And let us not be weary in well doing; for in due season we shall reap, if we faint not.
—Galatians vi. 9.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

It is the intention of the writer to use these columns to discuss the subject of poisonous plants. I shall, therefore, be glad to have readers of the American Journal of Veterinary Medicine send specimens of alleged poisonous plants to me. The queries will be given prompt attention.—L. H. P.

Is Rust Poisonous?

Dr. M. T. Lewis, of Stonewall, Manitoba, sends the following clipping from a Canadian paper. "Eleven horses of W. J. Young, of Griswold, died Wednesday of cryptogamic poisoning. This is the theory of experts who made an examination.

"Cryptogams are plants which do not flower and it is supposed that plants of this kind eaten by the horses caused their deaths. It is also a theory that the rust which was prevalent this year set up a poisonous condition on the plants and that there is danger of other fatalities to live stock in rust infected districts. Another theory is that the snow, rains and frosts of October caused the poisonous condition of the plants.

"Dr. C. D. McGillivray, of Winnipeg, Dominion veterinarian, who made a personal investigation, has sent samples of the feed eaten by the horses to Ottawa where it will be thoroughly analyzed and a definite report made."

In another letter from Indian Head, Saskatchewan, it is noted that the crops were poor in Manitoba last year and that there was a note in the Veterinary Record, an abstract from a German publication on the poison from rust. I believe there is no question that some kinds of rusts are injurious. The oldest record I have is an account by Dr. Virchow who made the statement that severe inflammation resulted in the nose of an old lady in which he found a great deal of common grass rust (*Puccinia graminis*). In Europe severe irritation of the lining membranes of the mouth producing sometimes an aphthous condition has been observed. Dr. Mohler expresses himself in a similar way, mentioning also ulcerous stomatitis. It is evident that rusty oats or wheat straw may sometimes produce serious trouble.

Is Curled Dock Poisonous?

Dr. J. S. Koen, of Des Moines, Iowa, writes concerning curled dock (*Rumex crispus*) as follows:

"Dr. R. F. Wolfe of Guthrie Center was called to investigate a case that presented evidence of forage poisoning of some sort in a cow. Another cow had been lost very recently without any previous knowledge of sickness on the part of the owner.

"The only plants to be found in the pasture where these cows were permitted to graze, excepting grass, was rather rank growth of yellow dock along a slough which had been eaten over to a considerable extent.

"Dr. Wolfe and the owner requested that we send these specimens to you for further information as to the possibility of their having any connection with the death of these two cows."

This smooth perennial, from three to four feet high, has leaves with strong, wavy and curled margins. The flowers are greenish white. Curled dock has an acid taste, owing to the presence of a soluble oxalate. It also contains the substance rumicin, which is a tasteless golden yellow substance. It acts as a rubefacient and discutient and is used for destroying parasites of the skin. Rumex causes nausea, watery feces, copious urination, a dry, spasmodic cough, and perspiration. I have often noticed that cattle will eat this and other docks only under stress of hunger. The common sheep sorrel (*Rumex acetosella*) is even more acid than the curled dock and is known to contain considerable quantities of potassium oxalate which, when taken into the system in considerable quantities, is probably poisonous. It is known that a number of related plants like the buckwheat (*Fagopyrum esculentum*) produces an urticaria not only in man but in lower animals. In man it some-

times takes the form of vesicles which may become scab-like. The irritation of smartweed (*Polygonum*) is also well known.

Influence of Poisons on Protoplasm and Enzymes

H. J. Creighton gives the following review of a paper by D. Fraser Harris* on the action of certain "poisons" and the influence of poissons on protoplasm and on enzymes, respectively. Harris makes the following classification of poisons: (1) substances that act by destroying the histological integrity of the tissues altogether—strong acids, alkalies and nascent elements, such as chlorin; the lesions may be so extensive that death results from shock or from internal hemorrhage; (2) substances that replace oxygen in the air breathed or prevent oxygen gaining access to the hemoglobin, such as carbon monoxid, carbon dioxid and methane; these substances kill by asphyxia; (3) substances that cause either spasm of the muscles of respiration or of the diaphragm or paralysis of them, so that the inspirations are suspended, e. g. strychnin and allied alkaloids; (4) substances that immobilize the biogens of the neuroplasm of the central nervous system, so that consciousness is ultimately abolished and the respiratory center paralyzed; all the narcotics proper fall into this group; (5) substances that both immobilize the biogens of the neuroplasm and also retard the velocity of one or other of the enzymes of internal respiration, namely, reductase and oxodase; among such substances are chloroform, ether, alcohol, quinin, potassium cyanid and arsenic trioxid; (6) substances that act injuriously on all three, the biogens, the endo-enzymes, and the secretion-enzymes; such substances are mercuric chlorid, silver nitrate, and all the salts of the heavy metals.

Hay Fever Plants

Professor H. M. Hall of the University of California has given an account of the relation of farm weeds to hay fever, in a recent number of the monthly bulletin of the state commission of horticulture. Professor Hall gives the biological test made with the coöperation of the biological department and Dr. Grant Selfridge of San Francisco. This test consists of applying a "small amount of the pollen to the nostril of a person susceptible to hay fever, or to the angle of the eye." If hay fever symptoms develop then the plant from which it comes is classed as a hay fever species. Dr. Hall lists the following species: western mugwort (*Artemisia heterophylla*), western ragweed (*Ambrosia psilostachya*), cocklebur (*Xanthium pennsylvanicum*), false ragweed (*Franseria acanthicarpa*), curly dock (*Rumex crispus*), lamb's quarters (*Chenopodium album*) and (*C. anthelminticum*) give mild reaction. The salt bushes (*Atriplex bracteosa*) give a very definite reaction. Professor Hall lists a number of other plants that are under suspicion.

*Dalhousie Univ., Halifax. Proc. and Trans. Nova Scotian Inst. Sci. 14, 96-107 (1915-16); cf. C. A. 9, 3253.

Action of Strychnin

P. J. Hanzlik makes the following review of a paper by A. R. Moore on the action of strychnin on certain invertebrates:

Squid larvæ (*Loligo pealii*) are normally positively phototropic. This is not affected by strychnin, but the larvæ take on a sepia color which is due to an enormous expansion of the chromatophores; this, in turn, is due to the contraction of the regulatory muscles. The entire musculature of the animal is spasmodically contracted; locomotion is, therefore, impossible and consequently there can be no regular orientation to light. Normally, a starfish, when touched, clings tenaciously to the surface of a vessel with its tube feet, but when treated with strychnin the behavior of the animal is reversed, so that when touched, it loosens its hold on the bottom completely. Complete recovery from these symptoms occur at the end of thirty-six hours, the animal being in running water. This drug action is explained as an effect on the radial nerves; the primitive connection between the sensory and motor system is affected in the same way as in the highly complex central nerve cord of vertebrates; a slight stimulation produces a spasmodic contraction of the entire musculature of the organism. One per cent caffein had no effect, and a saturated solution of chloroform caused effects in a measure opposite to those of strychnin.

Emergency Treatment of Poisoning[1]

J. Pharmacol 9: 167-9 (1916)

Samuel C. Beach, in a readable article on the emergency treatment of poisoning, states that the universal antidote, one that has attained the greatest reputation, consists of:

Pulverized charcoal	2 parts
Tannic acid	1 part
Magnesia calcined	1 part

The dose is a teaspoonful stirred into a glass of water. The author discusses cocain, mydriatics, belladonna, stramonium, hyoscyamus, aconite, gelsemium, carbolic acid and veratrum of the organic poisons.

Cultivation of Medicinal Plants and Poisoning

With the increase of the cultivation of medicinal plants in the United States more frequent cases of poisoning may be expected. According to E. L. Newcomb and M. H. Haynes[2] the medicinal plants grown in the

[1]Clinical Medicine, 1916: 429-431, 504-506.
[2]Am. Jour. Pharmacy 88:1-3.

United States contain quite as effective poisonous principles as the European grown plants.

Foreign Proteins

A highly suggestive article on the susceptibility of man to foreign proteins has been published by W. T. Longcope[3].

Forage Poisoning

Robert Graham and L. R. Himmelberger[4] discuss an outlook of forage poisoning occurring in Kentucky. The feeding of silage to horses has been abandoned in many localities because of the frequent disastrous results. Bacteriological examination of the suspected silage resulted in the isolation of a microorganism which was similar to one previously isolated from an oat hay and reported on. Experiments were conducted with horses and calves. The bacillus obtained was cultivated in nutrient media. A poisonous substance is evidently produced by the bacillus since sterile filtrates of cultures produced death. The paper is at least a suggestive contribution to our knowledge of forage poisoning. It is interesting to note that a bacillus may be associated with silage which on being cultivated on synthetic media is found to produce a substance poisonous to horses.

Mycotic Stomatitis

Mr. E. W. Murphy, a correspondent from Hamilton Victoria, Australia, writes me under date of September 23rd that there has been heavy loss of cattle in Australia from what they call "impaction paralysis," midland disease in Tasmania, and bush sickness in New Zealand. It may be due to some form of mycotic stomatitis. In Victoria the disease is associated with deficiency of lime and the presence of the mycelium of the fungus.

Lupines as Poisonous Plants

C. D. Marsh, A. B. Clawson and Hadleigh Marsh[5] have published the results of their investigation of lupines as poisonous plants. The following species were studied: *L. comatus, L. myrianthus, L. leucopsis, L. argentus* and *L. leucophyllus.* The experiments were made at Mount Carbon, Colorado, and Greycliff, Montana. Experiments were made with sheep, horses and cattle. They conclude that lupine causes little serious loss to cattle. The experiments establish the fact that horses may be poisoned by lupines. Sheep are seriously poisoned. They give a good review of the previous literature. In a summary of the conclusions they find:

(1) Lupines have been cultivated and used from the time of the ancient Greeks and Romans, but their poisonous properties have been recognized only in very modern times. Heavy losses of domestic animals were reported in northern Germany in 1872 and the succeeding years.

(2) While chemists have shown the presence of poisonous alkaloids in the lupines, the losses in northern Germany have been considered by investigators as due not to the alkaloids but to a hypothetical substance known as ictrogen.

(3) An investigation by Dr. Stollmann showed the presence of alkaloids in American lupines, and pointed to the probability that most, if not all, the poisoning of live stock in America was due to these alkaloids and not to ictrogen.

(4) Extended field work has verified the conclusions of Stollmann and has shown that all aerial parts of the lupines examined are poisonous, the seeds being the most toxic; then in order, the pods and leaves. This has been confirmed by preliminary experiments with extracts upon mice.

(5) The toxic substance is excreted by the kidneys; the intoxication is not cumulative, and animals may eat comparatively large quantities with no ill results, if the toxic limit is not reached at any one time. Inasmuch as the toxic and lethal limits are nearly the same, the prognosis for poisoned animals is not favorable.

(6) There is no form of remedial treatment that can be used advantageously for range animals. Poisoning in most cases can be avoided, even where the plant is abundant, by careful handling of the flocks, especial care being taken to see that hungry sheep are not grazed on fields where there is much lupine.

Larkspur Poisoning of Live Stock

C. Dwight Marsh, A. B. Clawson and Hadleigh Marsh[6] who published the results of an investigation of larkspur poisoning of live stock have investigated a goodly number of species. These authors review the rather extensive literature on the subject, giving an account of the papers dealing with the symptoms in stock poisoning as well as the chemistry. The authors give an estimate of the loss to the live stock industry. The losses vary from three to seven per cent. With the exception of loco poisoning, larkspur poisoning produces the heaviest loss to the live stock industry of the west. The major part of these losses occur in May, June and early July. The authors made a study of *Delphinium barbeyi, D. cucullatum, D. robustum, D. Menziesii* and *D. bicolor.* The paper presents figures showing the microscopic characters of a number of species for the purpose of distinguishing them. Experimental feeding of larkspur was carried

[3]The Am. Jour. of the Medical Sciences 152:625-650.
[4]The Jour. of Comparative Pathology and Therapeutics 29:107-116.
[5]Bull. U. S. Dept. of Agrl. Professional paper 405: 1-45, 2 f., 4 pl.
[6]Bull. U. S. Dept. of Agrl. Professional paper 365: 1-91, 12 f., 15 pl.

on for three seasons at Mount Carbon, Colorado, and Greycliff, Montana. These experiments showed that larkspur was poisonous to cattle and horses but not to sheep. Horses, however, on the range do not eat enough of the plants to produce any ill effects. The low larkspur are poisonous during the whole life of the plants. The tall larkspur are most poisonous during their early stages; after blossoming the toxicity gradually diminishes. The animals dying from larkspur are very much bloated. In all of the autopsies the heart was found in diastole and filled with blood. The lungs were congested and the kidneys acutely congested. There was also marked inflammation in each part of the alimentary canal. In treating the best results were obtained by using physostigmin salicylate 1 grain, pilocarpin hydrochlorid 2 grains, strychnin sulphate ½ grain. When this plant is abundant cattle should be kept away from it.

I might mention that a Colorado correspondent found *D. Penardii* to be poisonous. This species occurs on gravel knolls in Iowa.

Toxicity of Aconite

Charles C. Haskale[7] made a test of the cat and guinea pig method to determine the toxicity of aconite and seasons. It was found that seasons influence the toxic action of aconite. He considers that the guinea pig method is reliable because seasons influence, in a decided way, the resistance of the animals to poisoning by tincture of aconite.

Tincture of Aconite on Cats and Guinea Pigs

C. C. Haskell and H. B. Thomas[8] show that female cats are more resistant to the toxic action of aconite than are male cats and the reaction is more variable than in males. This is not because females were lactating or pregnant which as Hatcher has pointed out is important in influencing the resistance of cats to digitalis poisoning. In the experiments reported by the authors, none of the animals were lactating or pregnant.

Toxemic Deliriums

The veterinarian should be interested in an interesting paper by D. Singer[9] in an article on toxemic delirium and its management.

The toxins that may give rise to delirium are grouped under the following heads: 1, the use of drugs and food; 2, from microorganisms; 3, from organic disease interfering with excretion; 4, from strictly autogenous intoxications of a very obscure nature. He warns against the use of strychnin as a cordial stimulant and the prescribing of morphin. When hyoscin is given it should be used alone.

The Standardization of Drugs by the Use of Plants

W. M. Saylor[10] has published the results of some work in connection with the standardization of drugs by the growth of plants. The results obtained with strychnin are of interest. More or less irregular growth of plants is obtained in the weaker dilutions, while nearer the toxic point a gradual decline in activity and growth is noticed, while the toxic point is definite. The plant ultimately dies just as in animals. The work is in line with some work done by Professor Kraemer some years ago and published in the American Journal of Pharmacy, October, 1900.

The Poisonous Chenopodium Ambrosioides

This and its variety *anthelminticum* are common only in eastern Iowa. The oil is used in medicine. William Salant and A. E. Livingston[11] found that the oil from this plant produces marked depression of the isolated frog heart, the effect increasing with the concentration and successive perfusions. The fresh heart is less sensitive to oil of chenopodium than to one which has been perfused for some time. The oil of chenopodium is less active in the presence of olive oil. These authors believe that the oil of chenopodium affects the muscular substance in the frog heart.

Soy Bean Meal Poisonous

Stewart Stockman[12] calls attention to poisoning in cattle by feeding on meal from soy bean after extraction of the oil. Many of the Leguminosae or members of the bean family contain poisonous substances, and a considerable number of the plants of the family are valuable food plants. In recent years soy beans have been extensively used as food. The lesions might be described generally as those of hemorrhage of the tissues and organs. On removing the hide small and large hemorrhages were found underneath, some extended into the muscles, and at the borders of these there was a gelatinous edema. The cases produced in the laboratory by feeding on extracted soy cake and meal are identical in symptoms and postmortem lesions with the cases occurring in the field amongst cattle which were fed on similar material. The smallest amount consumed at the laboratory before the disease appeared was 172 pounds. The shortest time in which the disease appeared was twenty-nine days. The temperature was 106 and 109, and this seems to exclude the ordinary poisons but not the poisons of the ricin class.

[7] American Journal of Pharmacy, 88:243-246.
[8] American Journal of Pharmacy, 88:3-7.
[9] Illinois Medical Journal, 1916, January Clinical Medicine, 1916:978.
[10] American Journal of Pharmacy, 88:8-12.
[11] The American Journal of Physiology, 41:21-38, 10f.
[12] The Journal of Comparative Pathology and Therapeutics, 29:95-107.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

Immunity

By J. E. ZELTZER, Michigan Agricultural College, East Lansing, Michigan.

EVERY student of medicine is more or less familiar with the word immunity. But few have a clear conception of the phenomenon of immunity, which is very essential if one wishes to understand the real meaning and value of immunity.

There was a time when the medical man, as well as the layman, believed that the physician, by means of his drugs could cure any disease. We know better now. Not only are drugs incapable of curing some diseases, but in many cases they are valueless. More and more we are coming to the general understanding that it is nature who does the work in curing diseases. The physician or veterinarian is merely a humble assistant to nature.

With the advance of medical science in the last century, the methods of helping nature to cure certain diseases also advanced. The modern physician or veterinarian understands now that it is preventive medicine rather than curative he has to deal with in his daily work.

And therefore the knowledge of serotherapy is indispensable. But before we can appreciate the great progress that has been made in the science of serum-therapy, we must understand immunity and we shall endeavor to state as clearly as possible the complicated process called immunity.

The living animal is provided by nature with the means of combating more or less successfully the inroads of infective agencies. To this powerful weapon an animal possesses, the term immunity has been given. It really means the resistance of the animal body against an infectious disease.

As early as the year 1880 Pasteur came out with his theory of immunity which he called "exhaustion theory." Pasteur claimed that 'pathogenic microörganisms withdraw from the invaded body certain substances indispensable to their development, so that the body is in a certain sense exhausted. And the microörganisms invading the animal body later fail to find suitable nutritive material for their development and either die or leave the animal body. Pasteur's theory together with the theories of Bail, Wright, Baumgarten and others stimulated the further study of the phenomenon of immunity.

The most important theories of immunity brought out lately are those of Metchnikoff and Ehrlich. Metchnikoff's phagocytic theory was a result of a number of experiments done by him and later developed by his followers. It was explained as a purely physical action on the part of the blood cell.

The white blood cells (leukocytes), in the animal blood have the power to digest or assimilate bacteria that enter the animal body. And the success of the white blood cells against the bacteria depends upon the general health of the animal.

The most accepted theory of immunity of modern times is the theory of Prof. P. Ehrlich, commonly known as "Ehrlich's side-chain theory."

According to Ehrlich, we are to consider that certain cells of the animal body consist of a nucleus which he designates as a special "executive center" from which there radiate side-chains. It must be understood that this is a purely chemical and not

morphological conception of the cell. These side-chains are physiologically concerned in the process of nutrition. Nutritive substances brought to the cell by the blood or lymph can be utilized in its nutrition only after they have entered into combination with one or more of their side-chains of the cell.

It is conceivable that some of those side-chains combine with carbohydrates, others seize upon proteins and others still may fasten themselves to molecules of fat. In this way all serve in securing nutritive material for the growth, repair, or reproduction of the cell. It is also possible that certain pharmacological agents act upon the different tissues of the body through the combination with these cellular side chains.

Now in order for any substance to be poisonous to a given animal, there must be in the body of the animal cells with side chains capable of combining with the substance. It is not supposed that the cells possess side chains especially provided for the purpose of combining with poisonous substances; but it is possible that certain atomic groups which ordinarily serve to secure nutritive material for the cell, may combine with substances which are capable of bringing cellular destruction.

On account of the close chemical resemblance between the bacterial toxins and certain food principles, notably those proteid in character, we may say that the body cell must possess toxophile side chains. By this we mean that in the molecular construction of certain constitutents of the cell there are groups of atoms which may combine with bacterial toxins. Again, a given substance, in order to be toxic must possess certain cytophile side chains. Both the toxophile groups of the cell and the cytophile group of the toxin may be designated as heptophorous bodies. This means that it is by virtue of these groups that the toxin enters into the combination with certain molecules within the cell. However, the toxin is possessed not only of a heptophorous group, but also of a toxophorous group, and it is by virtue of the latter that injury is done to the cell.

Now when a small amount of bacterial toxin is introduced into the body of a susceptible animal, it, on account of its heptophorous group, combines with some cell of the body. Whether or not it causes a destruction of the cell depends upon the immediate injury done to the cell by this combination. If the toxin be introduced in sufficiently large quantity, it may completely destroy the cell, and if a sufficient number of cells are destroyed, death will result. If on the other hand, the amount of toxin introduced is small and the number of toxophile groups in the cell used up in the combination is small, the cell soon recovers from the injury done it, but recovers deprived of the side chains which have combined with the toxin. Feeling this loss and needing these side chains in order to supply itself with nutritive material, the cell throws out a new side chain, and when stimulated, by frequent introduction of small quantities of bacterial toxin, it finally not only makes good the loss which it sustained, but throws more side chains than it can possibly use. In other words the over stimulated cell secretes a great number of toxophile groups, and as frequently happens in case of tissue stimulation, the process continues to a point of over compensation. Finally the excess of toxophile groups thrown out by the cell becomes so great that many of them are cast off into the blood, lymphs, and other body fluids. These cast off toxophile groups constitute the so called *antitoxin*.

Now, if toxin be introduced into the body of an animal whose blood and lymph are filled with those loose toxophile groups the toxin is neutralized by these detached side chains and the cell escapes injury altogether.

In this way Ehrlich accounts for the promotion of antitoxin and the production of toxic immunity.

In conclusion we may state, that with the introduction of serumtherapy in medicine we are approaching a time when preventive medicine will take the upper hand in the human as well as in the veterinary medicine. And the future physician or veterinarian will rely more on the chemistry, pathology, and bacteriology than on his drugs. One has only to notice the great progress that serumtherapy has made during the past few years to convince himself of the validity of the above statement.

Bibliography of articles consulted in writing this article:

McFarland, Joseph: A text book upon the pathological bacteria for students of medicine. W. B. Saunders Co., Philadelphia, Pa. 1904. 4th Ed.

Vaughan & Novy: Cellular Toxin—N. Y. Lea Brothers. 4th Ed. 1902.

The Huxley Lectures on recent studies of immunity. Bull. Johns Hopkins Hosp., Baltimore. Vol. 13, pp. 285-299.

M. J. Roseman: The Immunity Unit. For Standardizing Diphtheria Antitoxin. Bull. 21, Treasury Department. Public Health and Marine Hospital Service, U. S. A. 1912.

"Stonewall" Jackson was killed in the Civil War while riding his favorite horse, "Old Sorrel." Friends of Jackson pensioned the horse, which lived to be 36 years old. On its death the skin was stuffed and is now on exhibition in the Confederate soldiers' home in Richmond, Va.—*The National Humane Review.*

Tetanus in North China

By J. R. SHAND, M. D. C., Veterinary Surgeon, United States Army, Tientsin, North China.

I BELIEVE that tetanus is a very rare disease in North China. In my two and one-half years' service I have observed three cases only, and they all belonged to the French government. Whether the disease has a soft spot for the French is a matter for speculation.

Case number one happened during May, 1916, in a pony; bay gelding, thirteen hands high, twenty-two years of age and good disposition. The animal's condition was thin on account of hard work and old age. This pony was the property of the French municipality, Tientsin, and was used for scavanger work, to a cart.

During one of my semi-monthly visits, my attention was called to a sick pony, by the Chinese corral boss. The pony showed characteristic symptoms of tetanus. Its shoes were removed, feet and other parts of animal were examined for wounds, but not even a scratch was observed. Having no antitoxin on hand, and as the animal was worth only about $15.00, it was thought best to let the pony take its chances without interference. He was placed in an end-single stall, of the stable accommodating thirty-five animals and carefully nursed. Not one drop of any kind of medicine was given. Sloppy food was placed in the concrete oat box, a pail of water near at hand, and plenty of sweet hay was accessible.

The disease ran its course, lasting three weeks, and after a month had passed the subject was put back to light work. The jaws were locked for four days only, but the muscles did not become overly rigid, and I do not believe the animal was caused any undue suffering. I told the corral boss to notify me immediately the animal was down and I would come and shoot him.

Case number two was in a mule belonging to the French at Tientsin. Female mule, gray, fourteen hands, eleven years old, good disposition, condition good.

When I was called to this animal, I found her "in the throes of tetanus," and it looked like a pretty severe case. The mouth could be opened only one inch. Jacques (the orderly), informed me that the mule had torn her tongue the week before, but it was impossible to get at the place as the tear was located near the mandible and local treatment was of course waived. At this time I had six thousand units of tetanus antitoxin on hand; I knew that it was useless in so severe a case, but I had to make a bluff, that is to say, to let the French army officers think that I was doing the right thing. I administered antitoxin at the rate of one thousand units per day until it was all used. However, I paid particular attention to the nursing of this mule. I fixed three single stalls into one box stall at the dark end of the stable, and hung blankets around. The sloppy hot chow was kept within reach, also the bucket of water, and plenty of hay; and bedding was used abundantly.

As the weather was ten degrees below zero, I gave her two extra blankets, and the blankets hanging round the stall kept away drafts. The animal kept getting worse and worse; for six days she did not defecate, so after the second day I added a handful of sulphate of magnesium to the sloppy food, and drinking water but this had very little appreciable effect, although the patient would suck up slop and water. After going along this way for five weeks with no improvement, I gave the mule up as moribund. If there was ever a case of chronic tetanus, this was one. The bowels were very sluggish, possibly one or two defecations occurring during twenty-four hours, the jaws had about two inches of play, the muscles were as hard as boards, and an enormous edematous swelling occurred on the belly. I told Jacques to keep nursing her along and as soon as her chow got cold to warm it up. I did not like to give her enemas on account of the extreme cold. This condition remained for six weeks, without any change whatever. On account of the enormity of the swelling under the belly, I had Jacques exercise the patient for fifteen minutes every day, gradually increasing. The first two or three days she was so weak that she almost fell down when moved, but however we persevered, and during the third week, we were rewarded by seeing a return to normal. At this writing (April) the animal is working daily, and no worse for the experience. This is a case where lobelin sulphate, I believe, would have worked wonders but my supply arrived when it was not needed.

Case number three was in a pony belonging to the French municipality, Tientsin. Gray mare, thirteen hands, ten years, disposition wild, a regular devil.

This pony showed symptoms of tetanus on February 5th, but the most peculiar thing was

the membrani nictitans. It was not necessary to raise the head to see it. Every time the pony winked her eyes the nictitans completely covered the eyeballs. This certainly gave the pony a peculiar countenance. This attack was caused by a back band sore. It was not a punctured wound, just an open sore, of one week's duration. As I stated before, this pony was a regular devil, so we put her in a large, loose box in a quiet part of the large stable, and supplied her with an abundance of sloppy food, boiled grain, hay and water, but without medication. We managed to daube tincture of iodin on her sore back a few times, and I told the attendants to just give her chow and water, keep the stall sanitary, and keep her blanket in place. I took great satisfaction in observing this case, possibly because she was so savage. The attack was not severe at any time, the jaws always had about two inches of play, but whenever anyone approached the stall, the mare would wheel round and charge with her mouth as wide open as she could get it; and with the exception of her Chinese driver, it was really dangerous for anyone to enter the stall. For three weeks she stayed in the stall showing unmistakable symptoms of tetanus, and every time she winked her eyes, the membrani nictitans would cover the eyeballs.

During the third week signs of recovery were evident, and on the twenty-first day, I let her out for exercise in the paddock. She was very weak and did not want to move, but desired to return to the stable. However, I instructed the boys to chase her round for five minutes and then return her to the stable. Exercise was increased daily for two weeks, then she was put to light duty and is now doing full duty and none the worse for her experience.

Summary:

Case number one received no medicine whatever.

Case number two received six thousand units antitoxin and two pounds sulphate of magnesium.

Case number three received a few applications of tincture of iodin on her sore back.

Cases number one and three did not apparently suffer to any great extent, but my heart went out to case number two. She certainly did suffer. Jacques slept in a little room in the stable and said that "Jenny" used to call him during the night and he would get up and talk to her, pet her and warm up her slop and water.

These three cases have proved to me (what I always held) that tetanus antitoxin is not a curative but only a prophylactic agent, and I firmly believe that the disease must run its course, but medicinal agents or substances that are sedative, relaxant and excretory stimulants in action undoubtedly save many patients that would otherwise die of exhaustion.

MESENTERIC HERNIA IN HORSE*
With Post Mortem Findings

On Oct. 25, 1916, I was called to the farm of Dr. H., a physician, to see a bay gelding, eight years old, weight about 1,500. The animal showed signs of abdominal pain as evidenced by restlessness (pawing, getting up and lying down, looking back at flank, etc.). Examination revealed a pulse of 30, respirations 16, temperature 100.2° F., visible mucous membranes not congested; peristalsis suppressed but still audible in small bowel, large bowels showed some sound. Questioning of attendant revealed that the animal had several bowel movements during the day and no change of feed, unusual amount or bad quality during the day previous to the attack.

Diagnosis: Indigestion with colic.

Treatment: Nux vomica, oil of turpentine and an aloetic physic bolus.

Prognosis: Favorable.

On Oct. 31, 1916, I was again called to see the same horse, at which time he revealed much the same symptoms as at the previous visit (colicky but not violently so). History showed that the animal had apparently recovered from the previous attack, but on being put to work the symptoms reappeared after about an hour's work. *Status praesens* essentially the same as at last visit; rectal examination revealed nothing. Same treatment as before. Animal was seen on November 10th, 13th and 15th, at which times symptoms were much the same as at the time of the first visit. The attendant related that at no time had purgatives acted to purgation, but bowel movements were normal. Oleum lini was now substituted for aloes and chloral hydrate given to relieve pain. The owner was advised that the animal would probably die in an attack of this kind and that symptoms were due to some form of bowel obstruction or stenosis, probably a calculus.

The animal was again seen on December 5th and 10th, showing the same symptoms as at previous visits. The attendant said the horse always showed colicky symptoms upon being worked and had had several attacks since my last visit. Chloral hydrate and oil were administered and rest advised for several weeks on a light diet of ground feed and good timothy hay. On Feb. 15, 1917, the animal had another attack somewhat more severe than the previous attacks, but otherwise the symptoms were much the same as previously. Nothing further was heard from the animal until May 7, 1917, when the attendant called by

*Presented at the Minnesota-Wisconsin meeting, Lake City, Minn., July 11, 12, 13.

telephone early in the morning saying the horse had the worst attack he had ever had, and that he had probably been sick a good part of the night, judging by the amount of damage he had done to the stall and stable wall. History showed several attacks during the past three months.

The clinical picture had now changed radically. The animal was bathed in cold sweat, breathing rapidly (40 per minute), pulse imperceptible and temperature 106.2° F., peristaltic sounds inaudible.

Diagnosis: Enteritis, and the attendant was advised to get the animal outside to facilitate dragging to its burial place. I gave one ounce chloral hydrate orally. The animal died shortly after noon.

Post Mortem Findings as follows: Animal lying on right side, skin had been removed. Sub-cutis showed nothing of interest. Upon opening the abdominal cavity a large amount of bloody fluid escaped containing some bowel content. Parietal peritoneum showed areas of diffuse reddening with shreds of fibrin. Large colon and cecum moderately filled with semi-fluid fecal mass; peritoneal covering showed areas of diffuse reddening. Stomach moderately filled with alimentary matter with a few bots adherent to mucous membrane. The small intestines showed a loop of approximately twelve feet in length passing through a small rent in the mesentery just ventral to the root of same. A complete knot had been formed by this loop after passing through the rent so as to cause a complete obstruction. Just cephalic to the knot was a gangrenous area surrounding a hole through which alimentary matter had passed. Part of the bowel involved in the knot appeared dark greenish red. The knot could not be untied except by cutting.

Post Mortem Diagnosis: Peritonitis due to escaped bowel content and localized enteritis due to mesenteric hernia and volvulus of small intestine.

The thing of interest to me in this case is not so much the post mortem findings themselves as their significance when considered in conjunction with the ante-mortem symptoms. Two things stand out prominently ante-mortem: failure of action of purgatives and length of time elapsed between first attack of colic and time of death (six months). These facts lead me to believe that the mesenteric hernia had existed for at least six months, but did not become strangulated until the night of May 6, 1917, when it caused death. Whether the volvulus existed at the early attacks is hard to say.

HERBERT LOTHE, D. V. M.
Waukesha, Wis.

X-RAYS USED IN A SURGICAL CASE IN A HORSE

A mare being taken to pasture was led across an old railroad track. As she lifted her right fore foot over the rail she went suddenly lame. The owner found a laceration about one inch above the coronet and also located a long sliver on the rail that had the appearance of having been broken off at the end.

The mare was suffering intensely and was hard to control. It was dark and I was unable to strike the splinter with a probe, not knowing the direction it had taken and the soft tissues had apparently closed over it. The animal was taken to the hospital and a radiograph revealed the exact location and

position of the splinter which was then easily extracted. A suturing needle was placed on the outside of the foot to mark the top of the coronet.

The wound was treated for a few days with Dakin's solution (.48%) and the mare was given 1,500 units of tetanus antitoxin.

Ft. Collins, Colo. H. E. KINGMAN, D. V. M.

The man who works to better the conditions of his sub-human brethren in any respect, in doing so is working to benefit his own kind. JACK LONDON.

And step by step, since time began
I see the steady gain of man.—Whittier.

RECTAL PROLAPSUS IN THE HORSE SUCCESSFULLY TREATED BY AMPUTATION

I was recently called to see a three-year-old colt that was found cast in its stall. This animal had been suffering from inanition for a time and because of difficulty it experienced in rising, the owner had kept the animal in a sling. The sling was not such as to afford the greatest possible comfort for the colt and the animal probably struggled to free itself and was as a result cast on the morning that I was called.

The thing which first attracted the owner's attention in this instance was a somewhat complicated case of *prolapsus recti*. There were about 10 inches of the rectum everted and protruding, which parts were considerably damaged and the entire mass was greatly swollen and thoroughly soiled. The colt while manifesting some evidence of distress was straining but little.

The affected parts were thoroughly cleansed and irrigated with a 1 to 5,000 solution of bichlorid of mercury, and during the process of cleansing, I was unable to make a careful examination of the prolapsed structures, and it was thought best to amputate the parts. Amputation was effected by a sectional ligature method.

A heavy chromicized gut suture material was employed for suturing, and by introducing the left hand into the prolapsed rectum, I was able to direct the course of the needle, which was operated from the outside, and in this way the contacting surfaces of the telescoped portion of the rectum were secured. The first suture was taken at the dorsal portion of the rectum and interrupted by tying. The subsequent sutures, which were so introduced that they overlapped one another, were continued around the circumference of the rectum without tying until all suturing was completed.

The operation having been completed as described, the owner was instructed to inject a few ounces of a mercuric solution at intervals during the next two days. A laxative diet was prescribed, the sling readjusted and the colt made comfortable. After 48 hours the prolapsed parts were again irrigated with a 1 to 5000 solution of mercuric chlorid, and by exerting a little traction and torsion upon the prolapsed parts, they were easily separated at the site of the ligature. The prolapsed tissues soon retracted into position and no further local treatment was administered and in ten days complete recovery has resulted.

Evanston, Ill. J. M. COZART, D. V. M.

Comment: There are several noteworthy features in connection with this case report that will engage the attention of surgeons. In the first place, the absence of marked straining at any time is unusual in such cases. It is possible that in this instance, because of the asthenic and somewhat debilitated condition of the subject together with the intense swelling of the parts, function of the local sensory nerves was for the time suppressed.

That no serious results followed this operation, because of the imperfect method of suturing the apposed prolapsed structures, is difficult to explain. While these parts were greatly swollen and the congested apposing structures were quite firmly held in contact with one another because of this swelling, it should seem that division of the prolapsed portion of the rectum at the site of the suture by torsion and traction would serve to derange the parts somewhat and that interruption of continuity would follow.

Finally, prompt recovery which followed operation in this case where it would be reasonable to expect that vitality was at low ebb, is remarkable. One would naturally expect that considerable peritonitis would result in such a case, and that such inflammation would be quite likely to result in septicemia and death within a few days after the operation was performed. However, there is no doubt that many cases of this kind are lost where complete amputation is effected at once because of the great difficulty that exists in effecting proper coaptation of the contacting surfaces of the bowel and fatal peritoneal involvement results. J. V. L.

"TETANUS AND ITS ANTITOXIN."

William Turner, M. V. O., M. D., in discussing the effects of tetanus antitoxin in *The Lancet* (London), cites a case wherein a soldier who had received a shrapnel wound in the shoulder region, was in a hospital for treatment. Sir William Osler examined this particular case and recorded certain observations in connection with it. Tetanus developed and antitoxin was administered by way of a lumbar puncture. Thirty-grain doses of chloretone were used, given per rectum, to quiet the patient.

Noteworthy features that are pointed out in Dr. Turner's article are that after a ten-day sojourn at the hospital, the patient's wounds showed little disposition to heal, but soon after the antitoxin was administered, marked improvement of the wounds was evident; discharge ceased within two days after the tetanus antitoxin was administered and rapid cicatrization followed.

With the general use of tetanus antitoxin on the western battle front in Europe, there has been noted a diminution in the number of cases of tetanus. However, Dr. Turner states that there are many cases wherein a long period of incubation occurs.

He concludes that, where tetanus antitoxin is used as a prophylactic agent, there may result: "(a) complete neutralization of the poison and nonappearance of the disease; (b) extension of the period of incubation and late appearance of the disease (delayed tetanus); (c) limitation of the area affected by the disease (localized tetanus); (d) diminished severity in the manifestations of the disease (modified tetanus)."

The curative treatment of tetanus by antitoxin, owing to the increasing number of recoveries in cases where it has been energetically employed, encourages the hope that it is a remedy of unquestionable value according to the observations of Dr. Turner. J. V. L.

FORAGE POISONING IN CATTLE

I was called to see a three-year-old Jersey cow that at first appearance seemed to be suffering from a bad choke, but on examination, I found a wad of grain fodder firmly packed against the palate. The impacted fodder was removed, but the throat was apparently paralyzed. The cow could not drink, although she tried repeatedly, and when undisturbed would fill her mouth with fodder or hay.

The symptoms observed were that the head was held extended, the tongue was protruded about three inches, and there was a slight incoördination of the hind quarters, although no stiffness was apparent. The temperature was 102° F. in the morning and 103.4° F. at night; respiration normal; pulse 60 to 65.

Medicinal treatment consisted in the administration of an average dose of epsom salt, hypodermic injections of strychnin sulphate over the laryngeal region twice daily, and the application of a mild blistering ointment to the throat.

I gave her nutriment with a stomach tube, and this consisted of one quart each of cornmeal and wheat middlings in three quarts of water. This was given every three hours, and pure water was kept within her reach at all times.

The cow lived a week, but the condition gradually became aggravated and she was finally destroyed by the owner, although at no time did she manifest evidence of any pain. I had no chance to hold an autopsy, but the owner reported that he had made a post-mortem examination and found the throat to be free from sores or other evidences of unsoundness.

Another similar case in a two-year-old steer differed only in that the subject was delirious during the last twenty-four hours before death, and amaurosis existed at first, but apparently subsided after the first twenty-four hours of the attack. This animal was unable to rise forty-eight hours after the initial attack and at first seemed to be resting almost comfortably. No digestive disturbances were evident, although the bowels moved tardily. Urination was normal.

I have had three additional cases, and the affection was very similar in each instance, and only one case has occurred on the same farm. I suppose this is some form of forage poisoning. The cow in the case described was fed dry feed and the steer was on blue grass pasture. Of the other cases, one was on dry feed and the other two on clover pasture. The affected subjects varied somewhat as to condition of flesh, although all were in good order.

Ashton, Md. H. S. ADAMS.

A COMPARISON OF THE VARIOUS TESTS FOR TUBERCULOSIS*

I will endeavor to point out some of the irregularities we meet in our work and at the same time give some of the more common causes for not always being able to make a correct diagnosis with any tuberculin test we may use. Temperature, ocular, and intradermal are about all the tests we have had to do with in the few years we have been using tuberculin. We are led to believe that tuberculin properly applied is as near an absolute diagnostic agent as we can have, provided the animal to be tested has never before been treated with tuberculin in any form. There are a few things that might cause us to err in coming to a correct conclusion in the temperature test. I might mention unusual surroundings, change of food, poorly ventilated barns, coincidence of mammitis, period of estrum, and in fact any condition that would cause a disturbance in circulation had tuberculin not been administered.

Ocular Test

We believe the best mode to adopt in applying the tuberculin is the camel's hair brush. This should be drawn over the upper part of the eye-ball and well down in the inner corner of the eye, holding the eye-lids shut over the brush for a moment. A record of seventy-five per cent correctness is credited to this test, the error being in failing to detect the diseased animal. We possibly lose this reaction more often by not making close observation, or the animal being tied so it can constantly rub the eye against the manger, obscuring the pus formation in the corner of the eye, that is so characteristic of the ocular reaction.

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

The ocular test is a good check on the thermal if the instillation is done about four or five days prior to the thermal injection. Reaction usually occurs in from twelve to sixteen hours after the time of subcutaneous injection. The duration of this reaction is sometimes very short.

Caudal Fold Intradermal Test

This should be 100 per cent correct if the animals injected have never before had tuberculin and the injection is properly made and the tuberculin is of good quality. We believe the mistake we all make is our haste in doing the work, and not having the animal properly confined and kept quiet at the time of injection so as not to wound the cutis with the needle. We should not inject too close to the rectum so as to obscure the reaction by having the expected inflammation gravitate forward around the sphincter ani; neither should we choose a place so far from the rectum that the examiner misses the reaction by not finding the point of injection at the place where he expects to find it.

Intradermal reactions are such that the owner can readily find them and when the reaction is formed we have a period of at least twenty-four to thirty-six hours from which we can be reasonably sure that the animal is tuberculous. Failures to find lesions in slaughter-house inspections are rather rare, although our diagnosis is not always confirmed. No matter by what method we condemn, we sometimes tag animals as tuberculous when we are not positive that they are reactors, but we prefer to err on the safe side. We should not be surprised that lesions are not found when we know that any gland of the body is liable to infection. We have had animals that have reacted the second time to the intradermal or temperature tests and showed no lesions on autopsy. Skin lesions will produce a reaction and these are very seldom found by inspectors, unless we ask for special attention to certain skin infections that we have noticed on our inspection.

Reactions are more often obscured by use of tuberculin just prior to making the tests. The temperature test if following the intradermal should be made before the fourth day or else put off until after the thirtieth day. In giving the temperature test eight to fifteen days after the intradermal test, the reaction comes up late or is entirely obscured.

L. D. Brown, D. V. S.

Columbia, Mo.

Learning by study must be won;
'Twas ne'er entailed from son to son.
—Gay.

POISONING IN HORSES FROM RUSTY WHEAT?

On February 11th, I was called to see an eleven-year-old horse. I found him covered with perspiration and cold; respiration 26; pulse weak; temperature 104° F.; congestion of the conjunctival mucosae. I gave twelve ounces of Barbadoes aloes as a cathartic and Cannabis Americana as a narcotic. Hot salt packs were placed over the kidneys. I also administered fluid extract of gelsemium in one and one-half dram doses, but the horse died one hour later, after I had left the place.

On February 15th, I received a call at the same place to see another horse. This horse also was down and unable to rise The owners said they thought he was the same as the first one. Upon arrival I found my patient down; respiration 32; pulse 80 and intermittent; temperature 104° F. Pain was manifested at intervals. There was congestion of the mucous membranes of the eyes. Upon looking at the food and inquiring, I found they had been feeding "hailed out" wheat which was badly affected with rust, so I came to the conclusion that the cause of the trouble was the rust. I administered the same medicine as in the previous case and applied the hot salt; but the horse died two hours later.

I should be very much pleased if any one who has had any similar experience would give me some information on the subject.

—J. A. H.

CESAREAN SECTION IN A COW

I was called to see a large red cow that had been in labor since the afternoon of the day previous. This was her third calf. Vaginal examination revealed a decided twist in the cervix that was so tight we could not even introduce one finger. Rectal examination verified the diagnosis of complete torsion of the uterus. On palpation through the rectal wall, the parts resembled a huge rope, so tight was the twist.

Cesarean section was advised and with the consent of the owner, we proceeded with the operation. H-M-C was given and this followed by chloral hydrate, one ounce, per rectum. It produced surgical anesthesia in fifteen minutes. Laying the cow on the right side, we prepared the field of operation by cleansing, shaving and bathing with alcohol.

We made an incision on the left side, beginning about five inches anterior to the point of the hip and carrying it downward and backward for about twelve inches. The muscular wall was divided by blunt dissection as much as possible. The incision made in the uterine wall was just large enough to deliver the calf. The amniotic fluid was removed with a siphon apparatus and the calf,

which was dead, was lifted out without any difficulty. The placental membranes were detached from the cotyledons and removed also. The torsion was relieved by turning the uterus completely over twice. The parts were cleansed and the margins united with a Lembert suture. The abdominal wall was drawn together with interrupted and reinforcing sutures.

The cow became conscious about thirty minutes later, and is getting along nicely.

Greensburg, Ind. DYAR C. WOOD, D. V. M.

MALIGNANT EDEMA

On a visit to a farm to see a mule that had "gone down" and could not get up again, I found by careful post-mortem examination and by microscopical examination of the blood, a disease that I would never have suspected in the least in such healthy subjects as the ones of which I am about to write. And right here I might say that had I not owned a microscope, I would to this day be in the dark and thought myself to have made a correct diagnosis on my first visit.

The mule I was to treat had been in apparently good health in the morning, having eaten its usual breakfast, but had suddenly become ill and grown weak so rapidly that in the short period of about two hours it was in a semi-comatose condition. On my arrival I found the animal lying on its side with complete loss of body control, pulse soft and weak, slightly accelerated in frequency, temperature sub-normal by several degrees. Auscultation revealed more or less bronchial breathing, the heart beat was regular, but sounds resembling regurgitation were present; mucous membranes icteric. A diagnosis of pectoral influenza was made and treatment given accordingly.

On leaving the barn I noticed one of the mules near the entrance lying, but only gave it a quick glance, thinking the animal was taking its morning nap. On my entering the barn upon my arrival this mule acted as though it wanted to kick me; therefore, I did not think anything of its lying down, but when the attendant saw this he said, "Well, Jack, it is something uncommon to see you lying down at this time of the day," and motioned to him to get up, but he refused to heed the motions. I then felt his pulse and took the temperature and found symptoms resembling those of the mule just treated and gave treatment likewise, telling the attendant that I would call next morning; but as the next day dawned with a very severe blizzard, I decided to call by phone only to find the wires down and the line out of commission.

I managed to call the following morning and was informed that both animals had died on the night of my first visit. No. 1 died at 9 p. m. and No. 2 at 1 a. m. I found blood oozing from both nostrils accompanied with gas bubbles and emitting a very disagreeable odor. A post-mortem examination was held which revealed that all organs were decomposed. This was most marked in the thoracic cavity. The lungs were very much congested and contained some gas of a very fetid odor. The heart was in such a degenerated condition that it was "mushy" in consistency. Owing to the severe cold weather, I thought it impossible for a carcass to be in a condition so greatly degenerated and decided to take some specimens for microscopical examination.

After making a number of stains and counter-stains, I found, much to my surprise, malignant edema bacilli in great numbers. I am preserving a number of slides for study at our next state convention, as this will probably be interesting to many.

Shortly after this, a calf and hog died on another farm several miles from this one and microscopical examination proved that the animals had died from the same disease. I might also mention another case that occurred last fall that became affected with symptoms of edema of the lungs. This horse died in seventy-two hours and the autopsy gave rise to suspicion of malignant edema. The microscopical examination confirmed the diagnosis as being correct.

Still another horse that showed signs of pleurisy and which had a very weak pulse was given a stimulant hypodermatically. In about eight hours the site of injection began to swell, but thinking it due to reaction, I paid no further attention to it and gave another on the opposite side of the neck only to find this to swell too, and the first to take on greater dimensions than ever. Upon cutting into these a straw-colored fluid escaped and of a very fetid odor. Suspecting malignant edema the swellings were incised deeply and freely and the circumference injected with an ethereal solution of iodoform. This caused the swelling to spread over a larger surface but it became more edematous than the primary swelling was. Internally antiseptics were given, not with the intention of curing the disease, but being aware of the high mortality, I decided to try almost anything that I thought might be of some benefit. The horse soon began to improve and made a rapid recovery.

This is my first experience with malignant edema in this form. I have seen many cases follow injuries and if I remember correctly we were taught in college that it always followed wounds. In the cases reported the animals did not have an injury upon them. I, therefore, think that it is a disease that can be contracted with equal ease through inhalation or ingestion.

W. P. BOSSENBERGER, D. V. M.

Williams, Ia.

URETHRAL CALCULUS IN A STEER

To my mind, the articles written for publication in veterinary literature and the papers read at association meetings on personal errors in diagnosis and treatment, are the most interesting and instructive of all professional contributions. I have made enough mistakes in five years' practice to fill a large book, and I believe my latest may be of interest to some of the readers of VETERINARY MEDICINE.

I was called to see a two-year-old fattening steer showing colicky pains and straining as if to defecate; respirations and pulse somewhat accelerated; temperature normal. The owner told me he had on the previous day cleaned up the barn floor and thrown out a large quantity of chaff, of which the steer had eaten heartily; that he found the animal sick the following morning and called me six hours later; also that the subject's bowels had not moved during the night. I made a rectal examination and found the rectum empty and the rumen in normal condition, but there was a large tumefaction to the right and just anterior to the pubis.

My diagnosis was bowel obstruction, probably impaction. I gave an analgesic and large saline purgative and left nux vomica to be given. I called the next day and repeated the treatment, there having been no bowel action. The patient at this time evinced no pain except a slight grunt when lying down. I advised the owner to get two gallons of linseed oil and give one quart twice daily until bowel evacuation resulted. The oil was given.

On the second day following this call, I saw the steer again. The patient had eaten nothing but appeared fairly strong; temperature normal; visible mucous membranes normal; heart slightly weaker; no bowel action. A rectal examination revealed no change in the condition. I inserted the stomach tube and gave a saline purgative in conjunction with a stimulant in thirty quarts of warm water. I left stimulants and told the owner to continue with the oil.

The next day the owner came in and said the patient was getting weak and acted greatly depressed after taking the medicine, and vomited occasionally, but that the animal had not purged and was as round and plump as when I first saw it. I told him I thought the only hope depended upon an operation and that, if he wished to pay for the services of another veterinarian, we would see what could be done. The owner agreed to this. After giving the consulting veterinarian the history of the case, he made a rectal examination and confirmed my diagnosis and found shreds of mucus and clots of blood in the rectum.

The patient being weak and the heart action bad, we finally decided that chances for recovery were slight and not to operate as the incision for the operation would detract from the value of the hide. The steer was vomiting and straining at this time and we gave up the case. Before leaving I told my client that after the patient died to do an autopsy for his own satisfaction and that he would find an impacted bowel.

The next day the owner telephoned me saying that he wished me to come out as he believed we were all mistaken regarding the cause of the steer's death. On arriving I found the carcass laid open in good position for a post mortem examination, but nothing disturbed. I examined all the organs and found everything normal except a badly distended and inflamed bladder and urethra. On incising the bladder, I found several small calculi; then by tracing the course of the urethra with a piece of wire for a probe, I found an obstructing calculus about the size of a pea, within two inches of the meatus urinarius. This, of course told the story. I suppose the blood and mucus in the rectum were due to the irritation from frequent rectal examinations. But why the inactivity of the bowels?

B. E. MILLER, D. V. M.

Nashville, Mich.

HORSE WASTAGE IN WAR

We are told by the military experts of France that the number of animals killed or injured, exclusive of natural causes, in the last two years on the Western front has amounted to nearly 47,000 a month. At the end of the first drive at Verdun, in eight hours, there was a wastage of 5,011 horses on a three-mile front. Every eight miles along the battle front in France there is a horse hospital. Among the horses in these hospitals approximately 27 per cent are there for sickness and about 72 per cent because of injuries. It is recently reported that since the war began there has been shipped from this country to France and England nearly 3,000,000 horses, and that the French government has paid through New York for its share of these animals something like $380,000,000. It is the purpose of the American Red Star Animal Relief to reduce this wastage among United States horses to the smallest possible minimum and save these unfortunate animals all the suffering that it can. Who will aid the American Red Star Animal Relief, with headquarters at Albany, N. Y., to do this work of mercy and patriotism?"—W. O. S., *The National Humane Review.*

FATAL GLOSSAL HEMORRHAGE IN DOG

A fox terrier, one year old, that had been accustomed to run loose, was tied to the limb of a tree and given a cotton mat upon which to lie. The animal was of very timid disposition and offered no resistance to this sort of confinement but was found at the end of a half day, chewing its tongue in such a manner that it had been badly lacerated and the blood was flowing copiously.

Because of the character of the injury done, it was impossible to determine whether or not a thread or some other substance had become wound around the tongue and caused the animal distress. During the course of the examination that I made of the dog's tongue, I removed what I took to be some shreds of tissue, and subsequently the animal seemed to be relieved and it ceased chewing the parts, but later the tongue swelled greatly, became cyanotic and the animal failed rapidly. Death occurred twenty-four hours after the injury was noticed and was due to loss of blood.

The mat upon which this dog lay was of cotton fabric, and there was no evidence of the animal's having gotten hair or other foreign substances in the form of a ligature about its tongue; consequently, the cause of the trouble is a mystery to me.

RUFUS W. FINLEY, M. D. C.

Rockford, Ill.

SUCCESSFUL UNDER SEEMINGLY HOPELESS CONDITIONS

Cesarean Section in a Sow*

I was called one Friday afternoon to a farm to aid a young gilt in parturition. I was away at the time of call and did not return until Monday morning. I answered the call Monday afternoon, which was three days following the time I was first asked to come. When I arrived at the farm I found what you might call a stunted gilt, not weighing more than ninety pounds. The animal appeared to be in great distress with the abdominal walls greatly distended. All mucous membranes were very dark and the gilt could not get on her feet at all. I tried to advise the owner when he called that it would be useless to make the trip as his chances to save the animal were very remote. He said that he believed that but told me to come on anyway. I regretted to make this call but concluded to prepare and do the cesarean section on this small gilt.

On making the opening through the abdominal wall, I found the cavity filled with a large amount of yellow fluid. This was removed and the operation carried out according to text-book instructions, except I did not attempt anesthesia. Three pigs that were immensely swollen were removed. This being done, all fetal membranes were removed, and as I said above, the operation was finished as described in our various text-books. The animal was taken off the table, and with little assistance she walked into the shed and ate some food. In a few days she was entirely well and was turned in to the feed lot. This gave me considerable encouragement, and I have since operated on three others and of which two recovered.

I didn't select this case to report as anything unusual or rare, as I know veterinarians often report this operation being done with good success. I selected it believing there are veterinarians like myself who are not as fond as they might be of giving attention to dystocia in swine, but by doing cesarean section, which does not require more than forty-five minutes, one can accept these calls with as much confidence as any other. I regard this operation as a safe one and in most instances it will be followed with results that will be very gratifying to both client and practioner.

Shelbina, Mo. R. P. POAGE, D. V. S.

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

A PECULIAR ATTACK OF AZOTURIA*

Early in the fall I was called to see a black horse weighing 1,500 pounds. It was being used on an oil wagon to haul to nearby towns. On this day, however, only a half load was being hauled because the roads were a little slick with mud. The first thing peculiar that the driver noticed about the action of the animal was that it stumbled and fell, but he thought it was probably due to the condition of the road. He unhitched and had to use the whip to get the animal to its feet. It was again hitched and the driver started on his journey. The horse had no use of its right hind leg. The client thinking his animal was stifled, gave treatment but without beneficial result, so I was called. A careful examination was made and no dislocated patella or fractured bone could be found. The muscles were normal, there being no trembling, hardness or swellings. The animal urinated in our presence and it was normal. We led it to the nearest barn, with much difficulty, as it used only three legs. By this time the owner was ready to destroy the horse as he had come to the conclusion that its leg was broken and it would be of no use any longer. He was soon dissuaded, even though it did look as if he were right. No treatment was administered, except that a man was di-

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

rected to remain with the animal and keep it as quiet as possible and notify us if any change took place. The next morning an early phone call revealed the mystery. The horse was up, had a little more use of its limb and the urine was a coffee color. Treatment for azoturia was given and the horse was working within a few days. This case is presented to show how easily one may be misled in dealing with this disease.

Kirksville, Mo. W. E. Neil.

MEDICINAL TREATMENT OF PERIODIC OPHTHALMIA*

I presume that there are few diseases that have undergone the variation of treatment that periodic ophthalmia has. It has been known and treated under a great many different names; but as Shakespeare says, "What's in a name?" In fact, it signifies very little as to the "why" of things; that is to say, why is this that way or that this way; and to sum it all up, if we do not know the "why" of anything we know very little of it; because it is the "why" that is the real active factor of anything; and so it is with periodic ophthalmia. Why is it not better understood? Why is it that the treatment of it is so varied, when the causes in all, or most cases, are the same? The answer is "you"—you who have been educated in the study of disease, in its control, in its prevention and treatment.

You have not taken the "initiative" and investigated for yourself; you have been satisfied to let the other fellow work out your problems for you, and content to follow his lead; not in all cases, but in a great many cases. In consequence of this, the treatment of this disease is in a state of chaos. In reviewing the treatment of periodic ophthalmia and going no further than 1829, we find a treatise by a British veterinarian by the name of Mr. J. Hinds, who calls the disease "moon blindness," stating that it is caused by a heated condition of the blood; and he recommends that the animal be bled, a shade put over the eye, and the horse can be worked as usual. Bleeding at that time was the general treatment used in all diseases no matter what the cause, whether the animal had the colic or had a nail in the foot.

Coming down to a later day, we find that a German observer says that the disease yields to the application of alkalies.

A committee was appointed, consisting of several members of the faculty of the veterinary school of Lyons, France, to investigate the cause and treatment. After a time they reported their investigations to wit:—a number of rabbits had been inoculated from a horse having the disease; that is; iridectomy had been performed on the horse and a piece of membrane was put in a quantity of water. After several hours a few drops of water were put into the eyes of several rabbits, which in turn contracted the disease. The same experiment was repeated on a horse with the same result; and a staphlycoccus was discovered in all cases. The treatment advised by this committee was potassium iodid in twenty to thirty gram doses daily, also a compress saturated with a solution of iodin, 1 to 100, and applied to the eye rather frequently.

One observer recommends antipyrin, which is to be used locally in solution of about 25 per cent strength. This is said to reduce pain very materially because of its analgesic properties.

In an article written several years ago by Dr. I. M. Luzader, of Nokomis, there was recommended colchicum in twenty-grain doses; also, if there was a tendency to rheumatism, this should be followed up with salicylate of soda, two-dram doses twice daily and this to be followed by tonics.

To give a list of the different drugs that have been employed in the treatment of this disease, would be simply repeating what you already know. Suffice it to say potassium iodid, atropin, boric acid, zinc sulphate, lead acetate in solution, the several oils, from skunk oil to whale oil, calomel or alum blown into the eye, and a host of others too numerous to mention have been used in the treatment of periodic ophthalmia.

To my notion, the great part of the treatment of this disease is seldom if ever carried out, for several reasons; first, the natural, or maybe I had better say the "unnatural," insanitary conditions under which our patients are kept; and next, the difficulty of convincing the average owner of the necessity of cleaning up the premises and providing proper ventilation and light. Dieting is also an important factor, as well as noting that all emunctories are functioning properly, for it is only by the proper observance of these important facts that a properly balanced treatment can be prescribed.

In my hands potassium iodid has proved the most reliable in handling this disease. The great trouble in the treatment of this disease (this applies particularly to the country practitioner) is that we usually see the animal after it has had several attacks, or the owner or some other fellow, equally well informed, has spit tobacco juice into the eye, or has thrown salt into it, or has done some other thing equally barbarous. Again it frequently happens that the veterinarian is unable to convince the owner of the necessity of internal treatment. He can't see how medicine given by the mouth can affect the eye; and if the owner can be induced to administer the

*Presented at the Illinois State Veterinary Medical Association Meeting, Peoria, Ill., July 18, 19, 1916.

prescribed treatment it is done under protest, and the first chance he gets he consults the neighborhood oracle. Or he may consult another veterinarian, who sees a chance to "hook it into the other fellow" and very promptly does so. The result is that you lose a client, and the other fellow gains one while you sit around and think.

We are all too prone to take the path of least resistance, instead of telling our client the exact facts. Instead, we say, "O that horse has got so and so, and he will probably go blind in time—better get rid of him while you can." The consequence is that the owner is only too glad to save himself and either sells or swaps the horse at the first opportunity, and another soul gets "stung."

A phase of treatment that I have omitted to mention is periorbital injection of iodin. This consists of the injection of a few drops of Lugol's solution into the fatty pad. It has met with considerable favor at the hands of some veterinarians; I have practiced it to some extent but I do not find it superior to the potassium iodid treatment when that is properly carried out.

Harvard, Ill. J. H. CRAWFORD.

PHARYNGEAL PARALYSIS

May 16th a dairyman called me to see an aged gray horse that was not eating. On examination it was found that complete paralysis of the throat had developed. The horse had eaten all of his food the previous night—had worked the previous day and had not been sick before in years. An unfavorable prognosis was given. Cause was attributed to fungi on food. The horse was given strychnin and a blister was applied over the pharynx. The following morning another horse, that had been regularly used to deliver milk, developed the same condition.

These horses were kept in a dark, insanitary, underground stable, and stood in adjoining stalls. They had received entirely different food—the delivery horse being owned by the son, who bought his hay and oats from a local dealer—the other horse being fed stock feed (purchased from a dealer in another town) and hay raised on the place. The delivery horse seldom had water from the well on the place, being watered from watering tanks along the route.

If contagious, or infectious, why did two other horses, kept in the same stable, fed the same food as the old horse, watered from the same well and standing in the darkest and dirtiest part of the stable in direct contact with these two horses, escape?

The outcome was of course fatal. Strychnin was given daily—blisters were applied to both horses and the horses were fed through the stomach tube. The old horse went down May 19th, the other May 20th, when both were killed. There was no rise in temperature at any time. The old horse's temperature being 101° F. the day he died, the other's was subnormal, 99° F. for a day before he died. No other symptoms such as are exhibited in cerebral diseases, were shown. The horses were bright and tried to eat until death. Weakness, however, developed very rapidly. Although another veterinarian was called in consultation, we could not determine any cause for their condition.

M. RAY POWERS, D. V. S.

Norwalk, Conn.

CONDEMNS STANDING CASTRATION

In the locality in which I live and practice the price for castrating yearling colts is $1. Not a graduate veterinarian does the standing operation. Two quacks do the standing operation and get less to do each year. I have castrated 2,000 and never injured one by throwing him.

Farmer Miles did the standing operation until it ceased to be a novelty, and after that he had them cast. The standing operation in this section is very much out of style.

Modoc, Ind. J. H. DEDRICK, D. V. S.

GROWTH RESEMBLING ACTINOMYCOSIS IN A HORSE*

I was called to see a three-year-old mare, with an enlargement situated between the rami of the mandible. It extended from the prominence of the chin to the larynx and outwards over the ramus. The growth was noticed some three months before the animal was brought to my attention. It had been blistered several times with Gumbault's caustic balsam, and tincture of iodin had been injected into the parts containing pus. It continued to grow, however, and upon examination I recommended that it be removed surgically. The growth was hard and fibrous in nature, containing small areas filled with thick, ropy pus, resembling actinomycotic lesions in cattle.

The animal was cast and the usual preparations made. Two elliptical incisions were made parallel with the long axis of the growth, about two inches apart in the center, coming together, anteriorly, opposite the interdental space and posteriorly, under the root of the tongue. The entire growth with the greater portion of the submaxillary and sublingual lymph glands was removed. It weighed about five pounds. The wound was packed with gauze and absorbent cotton and the skin was brought together and sutured. The sutures and packing were removed the next day and

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

the surface painted with tincture of iodin. Considerable of the surplus skin was removed and the open wound treated with white lotion and a dusting powder. It was entirely healed within six weeks and only a small scar remained.

This case is reported to get some of the practitioners' ideas as to what the growth was and its cause, as it has been my understanding that horses are not affected with actinomycosis or the ray fungus. Personally I believe this horse was so affected. Almost all of the glands in this region were removed, but the horse is doing much better than before. However, the parotid glands were left intact and their ducts were not severed, so there was plenty of saliva from that source to aid the digestion of foods.

Kirksville, Mo. W. E. Neil.

TRISMUS

Dr. W. B. Robinson's article on trismus appearing in the October, 1916, issue of the Journal was of especial interest in view of my experience with this condition while engaged in the practice of veterinary medicine in the prairie country of the midwest in the nineties.

At that time there was a comparative dearth of scientific publications available for the practicing veterinarian and it seemed impossible to obtain any light upon the true nature and cause of this condition. In every instance observed in mares with young nursing colts trismus almost invariably responded in a few hours to proper nursing of the affected dam.

It was not until recent years that a reference, in Hutyra and Marek's work on pathology and therapeutics of the diseases of domestic animals under the heading of tetany, to a somewhat similar neurosis in nursing women led the writer to seek further information concerning tetanus intermittens in human medicine.

In his work, "Modern Medicine," Osler treats very fully upon tetanies in the human subject, among which are those of pregnancy, parturition and nursing.

Whether or not these various tetanies have a common etiological factor has not been determined.

It is believed, however, that in these cases a disturbed calcium metabolism of the body leads to a hyperactivation of the neuromuscular responses which results in the tetany spasms.

Experiments tend to prove that there is an important relation of calcium salts to the excitability of nervous tissues, their withdrawal leaving the nerve cells in a condition of hyperexcitability which disappears upon administering a solution of calcium salt. Among the symptoms of this affection in the human patient as described by Dr. Osler are anomalies of circulation with edema and disturbances of respiration with cyanosis, and it would appear that at least some of these symptoms were observed in the mares under Dr. Robinson's care.

If, as might be believed, the cause of this condition is due to absence of calcium in the system as a result of nursing or of disturbed metabolism, the use of lime water and of foodstuffs rich in calcium would be indicated as a preventive measure as would likewise the administration of calcium to affected animals in an available form be indicated in the course of treatment of trismus.

The writer like a large number of veterinarians is not engaged in practice and accordingly not in a position to experiment with such treatment.

Should, however, any practitioners in the breeding country see fit to try this method of treatment and report results through the columns of the Journal, it would tend to indicate as to whether or not this form of trismus in mares is similar to tetanus intermittens observed in women and due to a lack of calcium salts in the system.

George W. Pope, D. V. S.

Washington, D. C.

INTUSSUSCEPTION IN A FOUR-DAY-OLD COLT

In response to a call on Friday, April 13th, I found a foal four days old in the recumbent position and unable to rise. The owner could give no history of the case except that the colt's bowels had moved and that urine had been voided the day before.

The pulse rate was 76 per minute; respiration accelerated; mucous membranes slightly injected; peristalsis absent. Palpation revealed soreness in the left iliac region. Upon raising the colt to its feet, it trotted around seemingly in no discomfort; it also suckled freely. I made a diagnosis of paralysis of the intestines.

Treatment consisted in rectal injection of four drams glycerin in warm water. This caused the evacuation of about four ounces of hard feces that were covered with mucus. Internally, I gave two ounces of cottonseed oil and followed this with one ounce every two hours of the following:

℞

Liq. strychninæ (1%)	M. vi.
Spts. frumenti	℥ i
Fluid extract gentianæ	℥ iss.
Aquae q. s. ad	℥ vi.

M.

At 9 p. m. of the same day, I was called to the case again and found it much worse, although when helped to its feet, the colt would stand and suck. A stiffness had de-

veloped in the pelvic limbs. Respirations were sixty; pulse about ninety, small, hard and weak. A rectal irrigation was given which produced no straining but it was retained for several minutes.

The colt died Sunday about noon and an autopsy revealed the presence of four intussusceptions, one thirteen inches long in the ileum, the other three being from three to six inches each and located, one in the cecum and two in the floating colon. All four were intensely hyperemic. All of the feces in the intestines were very hard and dry.

Clarence, Mo. W. D. Howe, D. V. M.

METRITIS AND VAGINAL LACERATIONS IN A COW

I have never, in eleven years' practice, had an animal die following the removal of the fetal membranes until I had the misfortune that I am about to relate.

A valuable Jersey cow calved eleven days before she was due. The herd to which she belonged is infected, and there have been many abortions and many cases of retained secundines. She had a little difficulty in calving and was given assistance by the caretaker of the premises after the head and front feet were presented. The cow's vagina was injured, there being a rent in its dorsal and ventral portions and abrasion of the mucous membrane of the walls. I was called about thirty-six hours after calf was born, to remove the membranes.

It was my intention to try the "hydro-method" but I found the membranes so badly lacerated that this was impossible. In passing, I might add that I have been anxiously looking for a case on which to try this method but have not yet found one. The membranes are either decomposed when I arrive, or else so badly torn that it is impossible to employ this method.

I removed the membranes very carefully and am satisfied that none were retained. I then irrigated the uterus with one-half of one per cent solution of lysol, using care to siphon out all, or practically all, of the solution. I advised irrigation of the vagina with normal saline solution and the application of vaselin to the injured surfaces.

The following morning the owner telephoned that the cow did not eat all of her feed. I examined the cow but found nothing abnormal, the temperature, pulse and respiration being normal. The genital organs were apparently all right as far as I could determine, except for the condition of the vagina, which was very sore, causing much straining when the hand was inserted. The os uteri was torn, but I had not noticed this on the previous day. The vagina and uterus were again irrigated with normal saline solution and the owner was instructed to continue irrigation of the vagina until it healed. I stopped to see the cow on the following (third) day, and she seemed better, eating considerable grass, ensilage, etc., although not as much as she did before calving. She was given a purgative, and I thought no more of the case until three days afterward when I was called again.

The cow was still eating, but not as much as formerly. There was considerable impaction of the rumen. The temperature was 102° F. On examining the vagina, I found the mucous membrane for about six to eight inches from the vulva necrotic and in shreds. Also at the os uteri, the same condition existed. I removed all the loose, necrotic membrane that I could, trying in so far as possible to avoid injuring the granulation beneath. The os uteri was nearly closed, but rectal examination revealed the fact that no distension nor inflammation of the uterus existed. The cow was treated for impaction and was visited daily for four days. The vagina was irrigated with lysol, one-half of one per cent solution, daily. The cow's temperature was down to normal on the seventh day, and on the eighth day she seemed to be doing nicely, the condition of the os uteri being apparently normal, the vagina healing and the appetite returning.

I did not see the cow again until the twelfth day, when I found her in a very weak condition, although still eating some. The temperature was 104° F.; pulse weak; respiration normal; symptoms of inflammation of the uterus well marked; and the condition of the vagina no better than when I last saw the case. Examination revealed that the os uteri was partly open so that two fingers could be inserted. I enlarged the os uteri sufficiently to introduce all of my fingers, but I could not pass my hand into the uterus. I was able, however, to remove considerable discharge and shreds of necrotic tissue but could not imagine where this tissue came from as I knew that no membranes had been left in the uterus. I continued removing decomposed tissue the two days following, irrigating the uterus each time with one-half of one per cent solution of lysol and following this with a normal saline solution, removing all of the solution that could be removed. The temperature dropped to normal on the thirteenth day, but the cow died on the afternoon of the fourteenth day.

Post mortem examination revealed eight inches of the vagina from the vulva covered with granulating tissue. The surface of the os uteri extending into the vagina had healed, but the entire mucous membrane of the uterus was detached and decomposed and could be lifted from the underlying tissue without difficulty. Although I examined the entire uterus

carefully, I could find but two normal cotyledons, the rest having sloughed off.

M. Ray Powers, D. V. S.

Norwalk, Conn.

EQUINE CRYPTORCHIDISM—A FEW CASE REPORTS

Never before had I castrated or assisted in the operation of cryptorchids, and as I have been requested to relate my experiences that they may be of some benefit to others, they follow: The subjects as they were found, ranged from two to eleven years of age.

Case No. 1.—Age seven years, weight 1,200 pounds; one testicle had been removed when animal was three years of age. Inguinal type. No post operative swelling noticeable; was ridden ten days after operation.

Case No. 2.—Age three years, weight 950 pounds; descended testicle had been removed when the animal was a yearling. Abdominal type; died in twenty-four hours from septicæmia.

Case No. 3.—Age two years. Both testicles were retained, and upon examination none could be located. Upon removal it was found that the left testicle was adherent to the peritoneum just anterior to the ring and the right one was of enormous dimensions, but no adhesions of this one were present. The animal developed a slight peritonitis, but has fully recovered.

The next seven operated on were very typical, and were of the unilateral, abdominal types. No deaths from this number occurred, and to my knowledge they are now in service.

Case No. 11.—Age ten years, weight 1,300; animal had been operated on at various intervals, and no testicle could be found. Scars were present on both sides and the incision was made therein. Both testicles were intra-abdominal, and cystic, being very small and hard for a beginner to locate, but the animal was kept down forty-five minutes. Very little swelling was noticed, and complete recovery resulted.

Cases number twelve, thirteen, fourteen and fifteen were very discouraging, as they developed septicæmia in twenty-four hours and soon died, excepting case number fourteen, which did not die until the fourth day. I attribute the loss of these cases to the owner's not removing the packing when instructed to do so. These were all very typical abdominal retention, and unilateral.

Case No. 16.—Age eleven years, weight 1,000 pounds; bilateral, one inguinal, and one abdominal testicle, the inguinal one causing more trouble than the other. No bad post-operative effects; animal recovered nicely.

Case No. 17.—Age four years, weight 1,400 pounds; unilateral, abdominal retention, testicle very large, and when canal was opened wider to permit testicle to pass out, the intestines protruded in such a manner that replacement was impossible, and the animal was destroyed.

Cases numbered eighteen, nineteen and twenty were very typical, all being of abdominal retention and unilateral and all being a left side involvement. All seem to be doing nicely.

Case No. 21.—Age two years, weight 1,000 pounds; both testicles retained, one inguinal, and the other abdominal. Animal has just passed the forty-eight hour period, and seems to be doing nicely.

The technic used in the above consisted mainly in the careful observance of asepsis which I think with a thorough knowledge of the anatomy, is the most important factor. The incision is made through the skin and fascia only, the balance is done by blunt dissection with the fingers; the peritoneal opening being made high up as possible. Material used in packing the canal at first was oakum soaked in five percent formalin, and sterile gauze enclosing the oakum, to facilitate easy removal. Later I employed steam-sterilized oakum and gauze, which gave equally good results. The packing is left in position for about twenty-four hours and no after-treatment is given.

Kremmling, Colo. G. B. Shinn, D. V. M.

MODE OF ACTION OF SODIUM CACODYLATE

I have gone considerably into what has been done to determine the mode of action of the preparations of arsenic during the last two or three years, particularly with the preparation known as atoxyl, which I have recommended. Sodium cacodylate is a salt of cacodylic acid. There are a number of other salts, but sodium cacodylate is the most generally used in medicine. One is surprised to learn the amount of literature that it is necessary to look over to get any idea of the organic action of these preparations of arsenic. It is thought that as the arsenic diffuses in the circulation, there are formed specific antibodies on the order of antitoxins, but after all is said and done, it is conceded that the action derived from arsenic preparations is due to the arsenic liberated in the circulation. We find that these organic preparations of arsenic diffuse slowly, and that is their advantage over the use of inorganic preparations of arsenic. If you want to inject Fowler's solution, for example, you would be required to use it in small doses because it unites rapidly with the tissues and is rapidly eliminated, but the organic compounds are slowly diffused and traces of arsenic may be found in the tissues three weeks after it has been given. As a matter of fact, and this is not based on my

own ideas but from research work, I believe that the beneficial results derived from organic preparations of arsenic are due to the inorganic arsenic being liberated slowly over a considerable length of time. Another advantage in the use of organic arsenic compounds is that they are less toxic. I am a firm believer in sodium cacodylate, and I have suggested a number of times that possibly it might be used in the treatment of sclerostomiasis, of which we have so much. It may be used either subcutaneously or intravenously, but when I am going after something that is floating in the circulation, I prefer an intravenous injection because I believe it is a little more accurate.

H. D. Bergman, D. V. M.

Ames, Iowa.

TETANUS IN A SHETLAND MARE

On June 8th I was called to see a Shetland mare with a colt two weeks old. The animal had apparently been well prior to that time. There were marked symptoms of tetanus. The jaws could not be opened; the membrana nictitans protruded across the eyes when the head was raised; great nervousness was exhibited. Considerable thirst was apparent, but little water could be swallowed. The legs were so stiff that the animal moved with difficulty, and it was quite a task to examine the feet for possible injuries. No wounds were found other than a scratch, practically healed, on the hind fetlock. Lobelin sulphate was given, and fluid extract of Passiflora incarnata was left to be given per rectum every three hours.

A Shetland pony suffering from a foot wound contracted tetanus on these premises last March, and died three days after the symptoms appeared. The owner was much worried for fear of losing another animal and wanted to try a treatment that his French butler had described as being used by veterinarians in the French army. This treatment consisted of constantly massaging the muscles of mastication with alcohol, and especially of the pharyngeal region, for several hours until these muscles relaxed. I told the owner it could certainly do no harm but that he had better continue the use of medicine as well. The butler and others went to work and continued until 11 p. m., when according to the owner, the jaws relaxed. When I saw the case the following morning, the pony was still stiff but the jaws were relaxed sufficiently to allow the animal to eat a little. Lobelin sulphate was again given and the use of the other medicine continued. I saw the case again at 8 p. m., when the pony was eating grass as well as any horse and exhibiting but little stiffness. Lobelin sulphate was again given and the owner advised to give the Passiflora incarnata twice daily for a few days.

This man is a dealer, and little attention is paid to the Shetlands, his polo ponies receiving most attention; therefore, the pony may have exhibited symptoms some time before he was noticed. Needless to add, the owner thinks he has a "sure cure."

M. Ray Powers, D. V. S.

Norwalk, Conn.

Comment: It is quite probable that this case was one wherein tetanus had existed for some time before the owner or others recognized its presence. In feed lots or in other places where a large number of horses or mules are kept together, tetanus may affect animals in such a mild way that, while a little stiffness in the gait of affected animals is noticed, close attention to individual subjects is not given and recovery is often spontaneous; attendants are not aware of the nature of the disease. In Dr. Power's case, the attack was sufficiently severe to compel attention and require treatment.—Eds.

ORCHITIS IN A JACK RELIEVED BY SURGERY*

A large jack, four years of age, had been ailing for about eighteen months from what I diagnosed as orchitis. As to whether I was correct or not, I will leave for you to judge, but anyway this jack had been carrying an enlarged testicle nearly the size of a gallon measure all this time. I was unable to get any knowledge as to the cause but presumed it was the result of an injury. At the beginning of the affliction, the jack received treatment but it did not appear to benefit him, and he also wore a support for some time without favorable results. Finally a fistulous tract appeared on the under surface of the scrotum. This, I believe, occurred about six months following the beginning of this trouble, and about one year later the owner called and said that he was tired of having the jack in this way and that I had his consent to do anything with him I saw fit. I replied that I could come out and open this fistulous tract and curette it out, but didn't think that it would benefit him.

I went out and placed the jack in position for this operation, but instead of curetting it, I made a ten-inch scrotal incision over the enlarged testicle and tried to break down the adhesions with my fingers. Being unable to do this, I dissected the fibrous mass loose, exposing the testicle and all the spermatic cord I possibly could. Then, with a sharp scalpel,

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

I cut away the fibrous tissue from the testicle and cord until it was within about one-fourth of its original size. I replaced it within the scrotal cavity and applied a few loose sutures, I made daily irrigations with a mild antiseptic solution, and after about eight weeks the jack was entirely well. From its appearance this testicle seems to be normal, the only abnormal thing one can detect being a light seam in the scrotal skin. Of course such a testicle does not functionate but it does not injure the jack's breeding qualities and in case the owner wishes to sell this jack this testicle will be very valuable. Owners of mares will also probably breed to him that would hesitate to do so if he carried only one testicle.

Shelbine, Mo. R. P. POAGE, D. V. S.

PROTEIN THERAPY

Investigators have shown that when a foreign protein is introduced into the tissues it stimulates certain body cells to elaborate a specific ferment that is capable of digesting the specific protein. The reaction is a physiologic process on the part of the tissues, in fact proteins are the normal stimulants to cell secretion.

Physicians have taken advantage of this truth and applied the principle in the treatment of persons suffering from rheumatism by injecting subcutaneously typhoid vaccine which contains proteins. Proteins from milk and other sources have been used for the same purpose. Both have given very satisfactory results, patients getting almost immediate relief from the rheumatic pains.

It is well known that unthrifty pigs often respond surprisingly well to a dose of anti-hog-cholera serum even when no cholera infection is present. We have reason to believe that this favorable response should be accredited to the foreign proteins in the serum rather than to the specific hog cholera antibodies. We have seen hundreds of young pigs that were stunted, thin, and scabby before treatment, rapidly put on weight and regain normal condition in a few weeks, after having been given the serum treatment. Practically all the controls gradually become weaker and poorer and finally died.

When the proteins of the hog cholera serum or those of the typhoid bacilli are introduced in the animal body, they are broken up and form new but simpler compounds which have the property of stimulating to increased activity various physiologic processes. By "speeding up" the body in this way, the poisons eliminated by the trouble-causing microörganism are destroyed and a transitory immunity is set up.

Protein therapy is still in its infancy, yet the prospects for its future development appear exceedingly bright. This article has been written primarily to call the attention of the practicing veterinarian to this new therapeutic agent and to urge him to give it a trial whenever opportunity offers. Reports of results will be looked for eagerly in veterinary journals. F. B. HADLEY, D. V. M.

Madison, Wis.

Comment—Those who are particularly interested in this branch of therapeutics may read an exhaustive discussion of the subject by Esther and Carl Schmidt of the Department of Biochemistry and the Hearst Laboratory of Pathology and Bacteriology of the University of California. The article appears in the June number of *The Journal of Immunology*, and includes eleven tables that show in detail the records of cases wherein experimental rabbits were employed to demonstrate the effects of the introduction of various proteins in the animal economy.—Eds.

ANTITETANIC SERUM IN ARTICULAR RHEUMATISM

At times the veterinary department of the experiment station is called upon to respond, by mail, to inquiries concerning the treatment of animals in the rural districts, especially where no qualified veterinarian is readily available, and the following case, which was one of that kind, may be of interest to readers of the JOURNAL, as it was to the writer:

On February 16th, a stock owner wrote that he would like my opinion regarding a very valuable jack which he had purchased in Kentucky the previous April. "As well as I can see," said the owner, "he has rheumatic spells. Sometimes it is in his shoulder joints; at other times in his stifle; sometimes he is very lame in one front and one hind leg at the same time; and I have done all I could for him."

The treatment which had been given was a purgative, followed by a course of sodium salicylate, with blistering of the affected joints.

This gave temporary relief, but the attacks recurred, with changes in the location of the affection.

As the breeding season was approaching, the owner was, naturally, anxious for the recovery of the jack, and I suggested a change to potassium iodid, and the use of hot carbonate of soda baths to the enlarged joints.

On March 10th, the owner wrote that the treatment "has worked like a charm." However, on April 26th, he wrote that the animal had again commenced to go lame in the left hind leg; that his stifle was affect-

ed; and that he wished further advice. And now comes the part which, to me at least, was quite interesting. In the interim I had met an acquaintance, a man of over middle age, whose occupation required his being in the saddle a great deal of his time. In conversation, he incidentally remarked that he had recently received a severe cut on one of his feet, and was advised by his wife to see his physician and have him inject a protective dose of antitetanic serum, at the same time remarking that he had been quite a sufferer from rheumatism which made it painful for him to mount his horse, especially in the morning, but that since receiving the serum, he had had little or no difficulty in doing so. This immediately brought to my mind the case of the jack, and I at once wrote to the owner, relating the experience of this man, and suggested that he obtain some serum, for veterinary use, follow the directions accompanying the package, and try it as an experiment on the jack.

On May 5th the party wrote that he had given one dose (hypodermically) on the third, and that the jack was fifty per cent better. He had given the second dose on the thirteenth, and was to give the third injection on the twenty-fifth.

On June 15th. there came a letter to the effect that three doses of the serum had been given, and that he thought the animal was completely cured: "he doesn't limp any more; the fever and swelling have all gone long ago; I am working him right along; and he is in good shape."

I then wrote and asked the party to kindly give me the details, as I might want to use them; and on June 27th, he gave me the following information: "The jack had been ailing for three months. I have given him three doses, in all, of the serum. I bought a package containing 1,500 units and divided it into three doses, making 500 units per dose.

"I injected it as near the joint as possible. I gave him the first dose on May 3rd; the second on the 13th; and the third on the 25th.

"In four or five days after the first injection I began to see a little change for the better. About seven days after the second dose, you just could see that his leg was a little weak; but in ten or twelve days after the last dose, you could not see anything at all; and now he is in good shape and working better than ever. So I can call him completely cured; for no man living could tell that he had ever been sick.

I think this is a very valuable trial, and I more than thank you for suggesting the serum treatment, etc."

"One swallow does not make a summer," of course, but this case has interested me considerably, and especially the manner in which the treatment suggested itself. The serum may have been used before in rheumatic affections in veterinary practice without my having observed the records; but if not, it seems worthy of further trial when opportunity offers, as it evidently had a beneficial effect in the case under consideration; although it may be that some other antitoxic serum might have had a similar effect. W. H. DALRYMPLE, M.R.C.V.S.

Baton Rouge, La.

The above illustration exemplifies the not infrequent occurrence of healthy bovine triplets. These calves were delivered by Dr. John Davies of Mineral Point, Wis., and the triplets were 42 hours old at the time they were photographed.

TETANUS

In the last three cases of tetanus I have treated, I have followed Dr. Steffen's treatment as outlined in his "Special Veterinary Therapy." I gave from 3,000 to 5,000 units of antitoxin and followed by giving fluid extract of passiflora to effect as long as the animal showed any signs of tetanus, usually eighteen to twenty-five days.

By using this line of treatment, I find that the subject is kept quiet easier, the expense is less, and the patients recover in better flesh.

The last case I had was in a five-year-old gelding of the draft type, and this horse actually gained flesh while being treated.

Grandview, Mo. E. L. YOUNG, D. V. M.

COLIC FROM INGESTION OF WIRE

I was called to see a 14-year-old gelding weighing about 1,200 pounds that had been on green pasture, and for some weeks no hay or grain had been fed. This animal had been very colicky but was somewhat easier when I arrived. On examination I found the temperature to be 104° F., pulse 60, respiration 10. I gave the subject three half-grain doses each of eserin and arecolin subcutaneously. These were given at intervals of twenty minutes and produced evacuation of the bowels. This occurred immediately after noon, and before evening the horse seemed to be considerably improved and was that night turned to pasture.

Next morning the animal was grazing and seemed all right until noon, when he lay down and again manifested evidence of colic. At 8:30 p. m. I was called again. Upon arrival I found the temperature to be still 104° F., pulse 60, respiration 30. I repeated the treatment that had been given on the day before and added four Reeks' capsules, which were given at intervals of thirty minutes. Small quantities of fecal matter passed several times. The animal continued restless, lying down, rolling, sitting up on its rump like a dog and then lying down again, frequently changing its position as if to get up and finally rising. This restlessness continued until 8 o'clock the following morning, when I administered one ounce and a half of chloral hydrate dissolved in eighteen ounces of water as a drench. Following this, I gave a quart of linseed oil. This quieted the animal for a while but the pain returned and continued until evening of the following day, when the animal died, three days after I had first seen it.

On autopsy I found a piece of baling wire about four inches in length, bent at one end in hook fashion. It had passed through the wall of the diaphragmatic flexion of the large colon and entered the sternal flexion, passing through both walls of this bowel. Adhesions between the colon and the floor of the abdominal wall had taken place, and apparently the wire had been in position for some time, as there was some cicatricial tissue in the vicinity of the wounded area and some stenosis of the intestine had occurred. A torsion of the small intestine also existed, but this was of recent occurrence.

The case was considered hopeless after the second day and I have no records of temperature, pulse or respiration subsequent to that. I am at a loss to know how the horse got the wire.

Billings, Okla. FRANK R. KNOTTS.

RUMENOTOMY SUCCESSFULLY PERFORMED UNDER UNFAVORABLE CONDITIONS

I was called out to the country to see a sick cow and found a typical case of impaction of the rumen. The cow was in great distress and her general appearance without history revealed the cause of the trouble. Both flanks were distended with solid impacted food, which had a consistency like that of a mass of sand, and the back was arched. She repeatedly tried to force a rectal passage and kept lying down and getting up every few seconds, indicating that she was in great agony. I immediately gave her my routine treatment for impaction and after watching her for an hour or so without noting any beneficial results, I suggested to my client that rumenotomy should be performed and that it was the only relief that could be given her. Clean water, towels and utensils were ordered and in the meantime I was wondering in what way the hair and filth, which had accumulated on the flanks, could be removed. This cow previous to her illness had been treated for lice and her coat was covered with dry ashes, that being the farmer's treatment, and this was intermixed with manure around the field of operation.

The cow was tied and backed up in a corner, the hair being clipped on the left side and vigorously rubbed with gauze to remove all dust particles. A solution of pixol, alcohol and commercial acetone was then swabbed on the area of the left flank, and with the assistance of the farmer and his smoked lantern which he held, I made the incision obliquely from above downward between the last rib and the external angle of the ilium. The skin, abdominal muscles, peritoneum and stomach were all cut through at the same time, making an opening large enough to permit the free passage of the hand. Before any of the contents were removed from the organ, a linen cloth was placed from the outer wound into the rumen in order to prevent any of the ingesta from getting into the abdominal cavity. Three full bushel measures of fermented food were taken out, and the parts cleaned in the best manner possible under the rays of the lantern. Thirty-day chromicized gut was used for suturing the coats of the stomach, Lembert sutures being employed. The abdominal muscles and peritoneum were sutured with Irish linen and likewise the skin, leaving an opening for drainage at the lowest point. Before suturing a saline solution was injected into the rumen, and before departure one-half grain of digitalin was given

the animal. She was then placed in a roomy stall with directions to give only a laxative diet the first week consisting of whole oats, bran and water, at intervals. A light nitrogenous ration was to follow the second week and thereafter until the cow was in good condition.

I made two after-calls to see the patient, and found her in good condition. This is the first rumenotomy I had ever performed as previous to this case I had never deemed it necessary to operate, resorting to saline injections through the left flank, but in such cases as the one here described, I will never hesitate to operate as a last resort.

ZINAS L. WILLIAMS, D. V. M.
Cleveland, Wis.

FLUID EXTRACTS AND STANDARD TINCTURES

In any disease condition, no matter of what nature it may be, fifty per cent of the battle is correct diagnosis. Most of the practitioners of veterinary medicine as well as of human medicine, are fully aware of this. Granting this much, then, the other fifty per cent depends upon the remedy applied. In some cases, no remedy known to modern science seems particularly applicable.

Many a case has been lost because the medicine applied has been of an inferior nature or lacking the constituents necessary to obtain good results. Especially is this true of our fluid extracts. These fluid extracts are made from the dried plants, and these dried plants in a good many cases have lost much of the important vital constituents; hence, the extracts made from them are found lacking.

Take for instance echinacea. This is a drug that has been praised by some and severely condemned by others. Investigations have proved the therapeutic properties of the green tincture or fluid extract to be all that has been claimed for the drug, while the fluid extract of the dried plant has been found lacking in a great many ways. Personally, I have tried them both and know this to be the case. Another feature about poor echinacea is that too often the wrong kind of echinacea is substituted. Do not merely buy echinacea, but insist on Echinacea angustifolia as this species is the true medicinal echinacea.

The manufacture of the so-called green tinctures or fluid extracts is homeopathic, and there are no two divisions into tinctures and fluid extracts, but all are of one potency and are called "standard tinctures." These so-called standard tinctures are non-official and are of the strength of ordinary fluid extracts. For me from now on nothing but homeopathic tinctures will do. Because of their exceptional therapeutic power, smaller doses can be used than with ordinary fluid extracts and better results become apparent.

Another feature of homeopathic medicine is the large list of non-poisonous drugs of high therapeutic power to draw from. Green tinctures of the following drugs are always kept on hand: Veratrum viride, Bryonia alba, Echinacea augustifolia, corn silk (Zea mays), Thlaspi bursa pastoris (shepherd's purse), Passiflora incarnata and Phytolacca decandra.

Mt. Sterling, Iowa. C. F. NEIS.

A RELAPSE IN AZOTURIA

I saw a relapsed case of azoturia in a hearse mare that went down in the country, was loaded on a sled and hauled to a barn and received some proprietary medicine (Dr. Pyle's). She was well bedded and nursed for three days, then got up and walked home three miles. She lay down during the night and was unable to get up in the morning, being distressed and struggling, and I was called out to treat her. I gave my usual treatment, and the owners telephoned the next morning that the mare was still down and much worse and for me to come without delay. I found the patient distressed and unable to get up and the owners discouraged. I applied my Conkey sling and soon raised her, and we were all agreeably surprised at her ability to stand on all four limbs and the functions of the body performed normally. I now advised treatment of one dram powdered nux vomica with a little syrup on the tongue and teeth three times a day for a few days. Result: satisfactory recovery.

I still remembered what Steffen said about the use of slings in azoturia, yet I agree with these owners that the sling saved the $300 mare, which was a good mate for the other one in the team and thus even more valuable.

I recently saw a case of cerebro-spinal meningitis that had been treated by a younger man and the owners called in his father for consultation. They could give no satisfaction, and the patient was down and unable to rise. Then I was called and used the slings and gave beechwood creosote and camphor with fluid extract of eucalyptus injected with a long nozzle syringe when the horse's head was well pulled up with halter and rope in the mouth, same style as Beechy's. This was administered every three hours. Result: recovery.

Pittsburgh, Pa. JAMES A. WAUGH.

COMMENT—We agree with Dr. Waugh that there are cases of azoturia wherein the use of slings is beneficial, but they are few. Too often the veterinarian uses the slings to raise a moribund azoturia patient when he knows that the suffering animal cannot stand and will make no attempt to do so. Nevertheless, the patient is subjected to this form of

needless torture simply to prove to the owner that nothing has been left undone in the attempt to save the animal's life and that it is truly a hopeless case. Experienced practitioners are not apt to err in selecting cases that may be benefited by raising with the slings, and usually they have sufficient confidence in their judgment to discourage such torture (and torture it is) in hopeless cases even when owners suggest it. Young veterinarians who have had little or no experience in handling azoturia in its very severe forms would do well to take Dr. Steffen's advice and not employ slings in these cases.—Eds.

A ROPE METHOD OF RAISING A RECUMBENT HORSE

The accompanying illustration will serve to depict a practical and simple method of using

a rope to lift a horse that is down. The rope may be quickly applied and when drawn tightly will serve to suspend a horse long enough for a trial posture.

Girvin, Saskatchewan. WILLET TANNER.

A CASE OF FETAL ANASARCA*

I was called to see a Jersey cow that had been in labor some ten or twelve hours. No discharge occurred, as apparently no fluids existed. There was nothing else in sight but the hind feet were presented into the vagina. The calf was almost dry, and I had to lubricate my hand before I could enter it. It was a normal posterior presentation, but the abdomen was greatly distended. A window cord was attached to the hind feet and considerable traction applied without appreciable results. By inserting the hand and palpating the abdomen of the calf, I found it contained an enormous amount of fluid, extending well back and between the hind legs, so I proceeded to relieve it of this fluid by making an incision, from which flowed, I should judge, at least twenty or twenty-five gallons of a straw-colored fluid. The calf was then removed without further trouble.

Kirksville, Mo. W. E. NEIL.

*Presented at the Missouri Valley Veterinary Medical Association meeting, St. Joseph, Mo., Feb. 15, 1917.

RANULA IN HORSE

A two-year-old filly weighing about 1,500 pounds, was found in the pasture by her owner, unable to eat because of a greatly swollen tongue. I arrived about 8:00 p. m. and noticed at once that the tongue was greatly swollen and protruding about two inches from the mouth. A careful examination failed to reveal any cause for the trouble, but it was very evident there was a severe inflammation present. I lanced the base of the tongue and about a pint of blood was allowed to escape. A wash of permanganate of potash was left and instructions were given to wash the mouth twice daily with a syringe. I also gave the animal feed rectally because of its being unable to eat. I gave instruction to the owner how he should feed the patient the next day. A stimulant was dispensed, with instructions that it be given.

The next evening, I examined the animal again, but found it no better, so I advised a consultation, to which the owner agreed. The next day a neighboring practitioner and I went to see the animal. The consulting veterinarian made a careful examination, but found no cause for the trouble. I also made another examination, and purely by accident I found what seemed a small fluctuating swelling on the ventral surface of the base of the tongue. I called the consulting practitioner's attention to this, and he agreed that it seemed somewhat fluctuating. We proceeded to lance at this spot, and about one quart of a foul-smelling fluid escaped. Of course, this afforded relief, and we were quite satisfied with our findings. We gave more instructions about feeding, left a wash for the wound and departed.

I returned the next day and found the swelling in the tongue much reduced. Instructions were left how to feed, and thinking there would be very little further trouble, I told the owner to call if additional treatment was necessary. I did not hear from the owner for about a week, when he called and said the animal was not doing well. Consequently, I called to see the filly that afternoon. Upon examination I found that the swelling was practically all gone, but the teeth had cut into the swollen tongue so that it left flap-like projections that extended out between the teeth and prevented the animal from using their grinding surfaces. The owner

said that he had been obliged to give a liquid diet all of this time. The animal was quite weak and had contracted a "bad cold." An operation was planned and the neighboring practitioner and I operated the next day and removed the flaps. The operation was a success, but on the following day the animal aborted and died a few hours later.

Altogether this animal was kept alive for about eleven days with liquid food and stimulants. I believe if the operation had been done several days sooner the animal would have recovered.

Redfield, Ia. R. C. MILLS, D. V. M.

Comment: In some glossal affections, because of the enormous swelling of the tongue, one cannot easily determine the exact nature of the existing condition. In every case, however, the region of the frenum linguae should be very carefully examined to exclude the possible existence of a retention cyst—ranula—at this site.—Eds.

EMBARRASSING MOMENTS*

I was called one dark rainy night to a place in the western part of the city, where the alleys were not paved and on arrival found a well developed case of tetanus. The attack was so severe and the animal of so little value that I considered treatment useless and advised the owner to have the animal killed; to this he agreed.

I have always favored a well directed bullet as being the most expeditious and humane way of destroying a horse, and as I had no gun with me, I called the police officer on that beat to kill the horse for us. When the policeman came up to the horse I asked him if he knew how to shoot a horse to kill him instantly; he said he guessed not, as only a few days before he had emptied his revolver into a horse's head and then had to kill it with an axe. I offered to show him where to shoot a horse so that he would always kill it instantly; he seemed much pleased, saying that the boys at the station had laughed at him a whole lot because after expending all his ammunition on a horse, he had to get an axe to kill it.

I showed him the exact spot at which to aim his gun and explained how he needs must hold the gun high since, as is usually the case in tetanus, the horse's head was greatly elevated. He stepped directly before the horse and only about a foot in front of its nose, and placed the gun in the proper position. I cautioned him to step to one side for reasons of safety and this he did. However, when he aimed from his new position he wasn't sure that he was getting it just right and he unconsciously stepped in front of the horse again. With the discharge of the gun, the horse lunged forward, knocking the policeman over into the mud, which was several inches deep, and falling partly upon the man; it lay without a struggle.

We actually had to roll the horse off the policeman, before he could get up, and when he did get up, his uniform, which was a new one, was a sight to behold. I went into the house and got some newspapers and with them rubbed the mud off his uniform as much as possible, but a goodly portion was left. I greatly feared the resentment of the policeman on account of the unfortunate outcome, but he did not look at it that way at all, and the first words he said when we rolled the horse off him were: "Be gorry, I know just how to do it now. He died without kicking."

Chicago, Ill. JAMES ROBERTSON.

I was called one night just after dark to see a horse out in Woodlawn, the silk stocking district of the South Side. We decided that killing was best for the animal and I called the policeman on the beat to do it. He demurred and said he had better see his captain, which he did, and came back with a report that the captain said we must not shoot in that locality since it was then dark and might frighten the people, which would result in endless telephone calls and requests for protection, etc.

I was much put out at this and assured the policeman that to shoot the horse was much the best way, and asked him, since his captain would not let him do it, to let me have his gun and I would do it myself. The policeman said that he could not do that, that I must not make any noise in killing the horse. I assured him that I would place the muzzle of the gun tightly against the horse's head and that the noise would not be heard even in the nearest apartment. Somewhat reluctantly he handed me his gun. I looked about for something to stand on that would place me high enough ,to properly direct the bullet and the only thing I could see was a board fence which was about seventy-five feet long and six feet high, made of boards stood on end. It was a very old fence and very rickety, and it was not without difficulty that I climbed upon it and had them lead the horse up to me. The gun went off with a terrific roar and the horse lunged forward, striking the fence and knocking the entire seventy-five feet of it down. I never heard boards make such a clattering noise. It sounded as if a building had been blown up. I fell two-thirds of the way across the alley, but lost no time in getting away from there before I could hear from the captain. O no, I didn't make any noise, I just precipitated a cataclysm!

Chicago, Ill. JOS. HUGHES.

*Told at a recent meeting of The Chicago Veterinary Society.

MEETING OF THE NEW YORK AMERICAN VETERINARY COLLEGE ALUMNI ASSOCIATIONS AND THE VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The annual meeting of the Alumni Association of the New York American Veterinary College was held in the lecture room of Carnegie Laboratory on the afternoon of June 6, 1917. This was by far the largest and most representative gathering of the old school that has been held in years, possibly that has ever met to attend one of these annual functions. Loyal sons of the old school were present from nearly every state at all near to the Empire state and great credit is due to the officers of the association and to Dean Hoskins in making it so generally known how the old school has "come back" within a year or so. President Tom Smith presided at the meeting and the interest was so acute in the prospects for the future of the school that it would be considerable of a task to attempt to report with any fulness the enthusiasm that so many displayed either in words of congratulation or promises of aid. Every sort of aid was offered—moral aid, physical aid, social aid, financial aid, and legislative aid.

After the routine and the outline and completion of details for future coöperation, Dr. Thos. B. Rogers of Woodbury, N. J., briefly addressed the graduating class, then read a paper dealing principally with the problem of agriculture and the role the veterinarian should play in such an important work. His paper was largely an analysis of a statement credited to Prof. Wing, who is professor of animal husbandry at the Cornell Agricultural College, New York State. Prof. Wing evidently has put in writing his opinion on the question of tuberculosis. He does not believe that any state or national authorities should have the power of causing to be destroyed an animal that reacts to the tuberculin test, believing that it is the owner's affair entirely what he shall do with such an animal. Dr. Rogers discussed, in very understandable English, his opinion of such teachings and pointed out the injustice and injury of it to the live stock industry. This paper will probably appear in full in the report of the New York State Veterinary College of New York City. The meeting then adjourned and after we had enjoyed a pleasant meal we assembled again to carry out the program planned by the New York City Association.

The following were the topics: "Infectious Vesicular Stomatitis of Horses," by Dr. Adolph Eichhorn. "Necessity of Watching State Legislation," by Dr. W. H. Hoskins, dean of the Veterinary College.

Dr. Eichhorn explained in the same lucid manner that we have heard him use at other meetings, the notable similarity between infectious vesicular stomatitis and the dreaded scourge foot-and-mouth disease. He told of being first summoned as a government representative to the Calumet yards where the disease was affecting a considerable number of horses that had been assembled for foreign shipment. The ailment was apparently new to all veterinarians who had to do with the horses for export, and he found upon reaching the yard some cases in the congestive stage, some with blebs, the epithelium involved, the submucosa not; the fluid an amber colored lymph and the blebs after rupturing leaving a corroded surface, lesions around the tongue and sometimes other parts, such as the hard and soft palate. The temperature was rarely over 103° F., soon dropping, the healing process being rather rapid if there were no secondary complications. These symptoms would make it plain why practicing veterinarians or those without state or federal authority should seek further aid. The futility of hazarding a diagnosis is emphasized when it is known that the disease next appeared in cattle in the Kansas City stock yards, the lesions being very similar to those cited in the horse and macroscopically quite typical of true foot-and-mouth disease, even the process of regeneration being as rapid as in true foot-and-mouth disease.

It is true that after determining certain factors, the differential diagnosis could be made but in Dr. Eichhorn's opinion, no one could make a positive differential diagnosis just from a clinical examination. The differences so far determined are:

That the regenerating process has a sort of a diphtheritic covering; no foot lesions present in cattle or horses. Calves that were inoculated by scarification developed the disease in forty-eight hours. Those injected intravenously proved negative. Hogs swabbed in the interdigital spaces did not develop the disease. It was readily transmitted to horses, which is not so in true foot-and-mouth disease. It is also transmissible from horses to calves.

As to the cause of this disease several organisms have been found but none have been positively incriminated. This information is also in keeping with the comparatively recent report published on the disease in Great Britain. The filtrate as far as is known has not produced the disease by scarification or intravenous injection.

Dr. Eichhorn's remarks were discussed by several. Dr. Ackerman stated that in talking with Canadian veterinarians some of them

believed it the same disease that was in South Africa during the Boer War, known as blue tongue disease. Dr. McKinney stated that he had been told that the disease in South Africa was very fatal. Dr. Ackerman replied that the disease spoken of by Dr. McKinney was probably what was known as "horse plague."

Dr. Hoskins then began his address by pointing out that the veterinary profession has not been forward enough in looking after legislation that rightly comes within its province, mentioning that if we referred to a single statement of the Secretary of Agriculture, that the loss of domestic animals by disease annually approximates two hundred millions, we could then sense the great responsibility that rests on the veterinary profession. He cited how for twenty-five years we failed to gain recognition in Congress for our army veterinarians but when the majority of the veterinary profession gave Congress to understand that this legislation was necessary, practically every bit of opposition was withdrawn. He added that all important interests have a legislative committee to keep them informed on legislative procedures and believes that we have erred in not recognizing this necessity since nearly all important matters are born in legislative channels. He said that during the last legislative session in New York State at least ten per cent of all bills coming before that body were of more or less interest to our profession and that every state in the Union should have its veterinary legislative committee and various states should assist the national bureau in its work, particularly the great work of meat inspection.

Speaking of the inadequate veterinary sanitary service in New York State he gave figures that showed that one-tenth of the sum appropriated for meat inspection by the national government would be really spent for New York State as it has one-tenth of the nation's population and New York is not matching this by one dollar. This branch of our government surely should be as important as state roads and other interests for which the state sets aside huge sums. Losses in New York State from infectious animal diseases are from three to five million per year, a high percentage of which could be prevented by proper state veterinary service.

Many of the bills introduced are delusive as was true of the Wicks bill this year aimed against dogs, as if dogs were the one thing that destroyed the sheep industry, when as a matter of fact external and internal parasites are the things that have discouraged sheep owners by destroying either the sheep or its wool. He said that he understood that there had been recently imported into New York State thirty thousand sheep with a disregard for the necessary inspection to guard against the introduction of disease with the sheep. New York is at present losing six dollars on every hundred dollars invested in livestock and this will go on or increase if such loose methods are allowed to continue. There has been a considerable increase in the population of our country in the last twenty-five years with a decrease in the livestock. The state is spending great sums in supporting agricultural colleges and experiment stations and still the farms continue to be abandoned, much of which has been due largely to plagues that make animal health and life uncertain.

In closing he made a stirring appeal for all veterinarians to show their willingness to serve their country in the present conflict, 625 veterinarians being wanted at once.

Before adjourning there was a discussion to devise ways and means for veterinarians to look after their brother practitioners' practice during their absence while serving their country.

Goshen, N. Y. J. F. DeVine.

VETERINARIANS OF WESTERN MICHIGAN MEET

On June 15, 1917, the Western Michigan Veterinary Medical Association, combining the veterinarians of Ottawa, Muskegon, Kent and Allegan counties, met at Streator's Resort, Miner Lake, Allegan, for their June sessions.

A fish dinner and basket lunch were served and enjoyed by all present, and an address of welcome was given by Mayor Secrist of Allegan, followed by an address by Mr. Harper of the State Livestock Sanitary Association, and one by Dr. Hayes of the B. A. I.

A paper by Dr. D. M. Campbell, who unfortunately could not be present, was read by the secretary.

Five applications for membership were accepted and it was decided that the next meeting in October be a traveling clinic meeting.

The meeting adjourned at 5 o'clock and everyone went home feeling that they had had one of the best times ever enjoyed.

There were about twenty veterinarians and their families present.

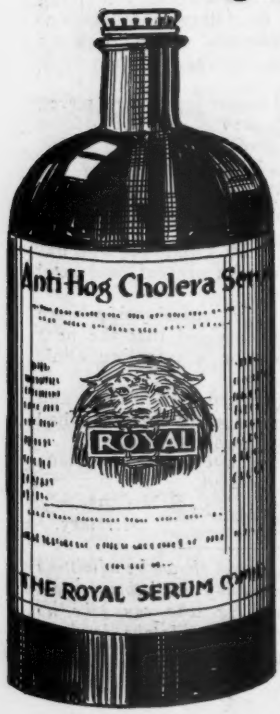
Grand Rapids, Mich. C. S. McGuire,
Secretary,

Greatness of mind is not shown by admitting small things, but by making small things great under its influence. He who can take no interest in what is small, will take false interest in what is great.—Ruskin.

Brother Veterinarian- Are You in the Serum Game Right?

If so, you realize that the **"know how"** is not so scientific a matter as the **"know when."** And you realize also that the **"know when"** is where the average hog breeder or owner usually makes his costly blunders. The Graduate Veterinarian not only **"knows how"** and **"knows when,"** but he knows that the actual results he is going to get, by applying his scientific knowledge, depend largely upon the high potency of the Serum he uses. Therefore, as he values his reputation, so will he value the Serum he employs in his practice. In other words, he will not jeopardize his reputation by using a Serum simply advertised as Anti-Hog-Cholera Serum. He will prefer a "Quality Serum"—just as he prefers a pure bred hog to a scrub or even a grade, no matter how good.

Quantity *vs.* Quality



In manufacturing Serum **"Tail-Bleeders"** will get approximately 8,000 c.c. of serum from a 300 pound hog, while **"Throat-Bleeders"** get approximately 4,000 c. c. of serum from a 300 pound hog—or about one-half as much. Just as some coffee makers will get 8 cups of coffee from a given quantity, while another will get but 4 cups; but, say man!—you know which coffee makes you pass back for another cup. Same thing is true with Serum.

"Throat-Bleeders" always advertise their Serum as "Throat-Bled." **"Tail-Bleeders"** are not so proud of their product, so they invariably advertise it as Anti-Hog-Cholera Serum, using such adjectives and high-sounding phrases as they may have at their command. But, you bet, they never advertise it as **"Tail-Bled Serum."** Why? **"There's a reason."**

Royal Serum is **"Throat-Bled"** exclusively. The Veterinarian who uses it exclusively is in the Serum Game Right, with all his might.

Visit our plant and investigate our methods of manufacturing while you are in Kansas City attending the meeting of the American Veterinary Medical Association, week of August 20th.

Royal Serum Company

Laboratories:
Osage and Adams Sts.,
Kansas City, Kans.

Address orders and inquiries,
Packers Station,
Kansas City, Kans.

THE ECONOMIC IMPORTANCE AND GENERAL PREVALENCE OF PERIODIC OPHTHALMIA

(*Continued from page 522*)

mon to find one or more cases of ophthalmia. If you have the time and patience to trace the past history of such buildings, you will find ample evidence that the various owners of such property spent a large part of their time in raising blind horses. It is while listening to a historical narrative about such old farm buildings, that one almost becomes convinced that periodic ophthalmia is a contagious disease. Whether this is so or no, I am unable to say, but the longer I study the various ramifications of the disease, the more I am inclined to think that it is.

INFECTED FRACTURES SUCCESSFULLY TREATED

On March 2nd I was called to attend a registered Holstein heifer, two years old, that had broken her leg. I found that the heifer had broken the metatarsus at its inferior third, and about three inches of the superior and also of the inferior part of the bone were protruding through a wound four inches in length. The bone was covered with dirt and the wound was packed full of earth. My prognosis was unfavorable, but as the animal was valuable, the owner wanted me to do something.

Consequently, I told him to boil some water and let it cool, and in the meantime to bring some warm water. I then took the warm water and added liquor cresolis comp. and cleansed the wound with this. By the time I had removed most of the dirt the boiled water was cool enough to use. In this I dissolved bichlorid of mercury tablets, making a 1 to 1,000 solution. With this solution I cleansed the wound and fractured ends of the bone and then controlled all hemorrhage. I again douched the wound inside and out, dried it with sterile cotton and applied tincture of iodin and glycerin, equal parts. I next reduced the fracture and applied splints and a plaster of Paris cast, leaving the wound open. After the cast had hardened I applied sterile cotton saturated in the iodin mixture to the wound and applied another bandage. I injected one ampule of Abbott's polyvalent bacterins and in two days redressed the wound, and injected two ampules of the bacterins. I then instructed the owner to dress the injury daily with a 1 to 1,000 solution of bichlorid of mercury. He took great pains with the dressings and in eight weeks I removed the cast and the wound was practically healed and the bone was reunited.

The heifer never missed a feed and is in better condition than before the accident. At first there was considerable discharge but this soon ceased and everything took on a healthy appearance.

On March 19th I was called to see a horse that had been kicked, resulting in a fracture to the distal end of the tibia. I placed the animal in a sling, made an incision in the skin over the fracture, at the point of entrance of the calk wound, controlled all hemorrhage and cleansed the wound as in the other case, and applied a cast and splints. The splints were made from a peach basket, and the wood was steamed to conform with the shape of the limb. To this wound, as a dressing, I applied bicarbonate of soda, bound on with sterile cotton and bandage. In eight weeks I removed the cast and found the wound healed and the bone reunited.

Such results may not be new to all of the profession but I always considered an infected fracture as hopeless. Henceforth I shall give them all a trial.

Canton, Pa. F. B. M.

VETERINARIAN NOT TO BLAME FOR ACCIDENTAL POISONING

Some time ago Dr. L. H. Coulson, of Grayslake, Ill., was called upon to give the ingredients of a mixture dispensed in treating a case of laminitis in a horse three years previously. The occasion for the aforementioned inquiry was the death of one man and the serious intoxication of another from drinking, as it was thought, "horse medicine" dispensed by Dr. Coulson, instead of whiskey. It developed, however, that the fatal medicine had not been put up by Dr. Coulson, but was some other mixture, the exact nature of which was not ascertained. Presumably there was reason for confusing the containers, if for no other cause, for the reason that the bottles were similar in appearance.

In this instance if Dr. Coulson had not habitually labeled with care all medicine that he dispensed, the dying man's statement that he thought it was "horse medicine" he had drunk by mistake, might have caused many to censure the veterinarian in question.

We have repeatedly pointed out the likelihood of such unfortunate occurrences, and here take occasion to repeat that the veterinarian who does not carefully and properly label clean containers that do not contain other labels, whenever he dispenses poisonous materials, is criminally negligent. Every practitioner should carry proper labels and in the absence of suitable bottles, employ clean glass fruit jars for dispensing his medicines. These serve well and may be gotten without difficulty in most places.

A Word on Anti-Hog Cholera Serum

Many successful veterinarians have come to realize that all they need know about serum potency or purity is told by the Trade Name "CORN STATES," which name typifies "Polyvalency."

"It has been established and substantiated by such men as Pfeiler and Joest that there are a number of bacteria of the colityphus group which cause affections of hogs characterized by necrosis and ulceration of the large intestines."

Corn States Bulletin, Vol. IV, No. 1, directs the attention of the veterinary profession to specific secondary invaders—their booklet on "Swine Safety" refreshes the memory on 100 Highpoints about serum administration.

DOCTOR, YOU GET BOTH SERUM AND SERVICE WHEN YOU USE CORN STATES.

A. V. M. A.

VISITORS WELCOME

Kansas City Branch **512 Southwest Boulevard**

When attending convention.

Iowa Branch

CEDAR RAPIDS, IOWA

328 South 14th Street

Distributers

The Wendt-Bristol Co., Columbus, Ohio.
Wm. D. Duncan, Ottawa, Ill.
Jno. R. Porter & Co., Rockford, Ill.
Decatur Drug Co., Decatur, Ill.
Morris-Dickson Drug Co., Shreveport, La.
Oklahoma Physicians Supply Co., Oklahoma City, Okla.

Distributers

Wells-Yeager-Best Co., LaFayette, Ind.
Wayne Pharmacy, Fort Wayne, Ind.
Duesterberg & Kramer, Vincennes, Ind.
C. J. Rouser Drug Co., Lansing, Mich.
Spence-McCord Drug Co., LaCrosse, Wis.
Hegarty Drug Co., Little Rock, Ark.
John Schaap & Sons, Fort Smith, Ark.
Rupp & Bowman Co., Toledo, Ohio.

CORN STATES SERUM COMPANY

44th Ave. and U St. **OMAHA, NEBRASKA**

Box 123 **South Side**

U. S. Veterinary License No. 99—Sold Veterinarians Exclusively

Write us for price, literature, and our "Service Plan to Increase YOUR Business."

COLORADO VETERINARIANS MEET

The semi-annual meeting of the Colorado Veterinary Medical Association, held at the Agricultural College, Fort Collins, on May 31st and June 1st, was one of the most successful and largely attended ever held by this body. The first day was given over to a business session and the reading of papers. The second day was taken up with a clinic. Entertainment consisted of a banquet at the Northern Hotel on the evening of May 31st, and a picnic lunch at noon on June 1st. The most important business was the extension of an invitation to the A. V. M. A. to meet in Estes Park in 1918. The out-of-state guests were Drs. H. Jensen, of Kansas City, H. R. Millard and Y. R. Balmer, of Cheyenne.

After the address of the president, Dr. R. H. Bird, the subject of the newer treatments for blackleg was taken up in papers by Drs. Owen Howells and O. B. Morgan. These were discussed at length by Dr. Jensen and a considerable majority of the members. It seemed to be the consensus of opinion that the liquid vaccine, germ free filtrate and blackleg serum were a considerable step in advance of the old spore vaccine.

Dr. H. E. Kingman gave his experience in the use of Dakin's solution, reporting on a considerable number of cases that had been under his charge in which treatment consisted of daily irrigations with Dakin's new antiseptic.

Dr. H. S. Eakins reported on some pharmaceutical specialties which he believed would be of value to the profession, illustrating his talk by showing samples of the preparations discussed.

The rabies outbreak at Fort Lupton, Colorado, was covered in a paper by Dr. H. V. McCullah. This was especially interesting as it dealt largely with rabies among cattle. The records had been accurately kept and there was much information on the incubation period and symptoms of this disease in the bovine species.

Under the title of "A Glimpse at Opportunities," Dr. Charles G. Lamb discussed the great value that a knowledge of breeding and feeding would be to the veterinarian, illustrating his talk by detailing some examples from his experience.

"Cotton Seed Poisoning in Pigs and Calves," was discussed by Dr. A. G. Wadleigh.

The ever-recurring problem of contagious abortion was reopened by Dr. I. E. Newsom, who gave as his excuse for bringing it up that the experiment station proposed to do some work on the subject in which the local practitioners could be of assistance.

A large and varied clinic took up the time of the second day. One of the most interesting cases was that in a dairy cow which had been diagnosed as traumatic pericarditis. She was presented on the day of the meeting with a slight swelling on the brisket. After examination she was destroyed and it was found that the left lung occupied fully two-thirds of the thoracic cavity and was filled with gallons of pus. In the abscess was a nail which was evidently the cause of the trouble. The heart while very flabby and much compressed showed no suppurative lesions. This reminded us of a case at the same clinic two years previously in which the foreign body had penetrated the spleen instead of the pericardium as is so often the case.

Dr. A. A. Hermann, of Littleton, presented some new instruments, among which was a probang attached to a battery in such a way that the end constituted a powerful magnet. It was his idea that this might be used to withdraw nails and pieces of wire from the reticulum of cattle.

Some other cases were poll evil, suppurative metritis in the mare, a peculiar nodular condition of the teats of cows, and a mechanical injury to the loins resulting in an abscess that had penetrated the peritoneal cavity.

Ft. Collins, Colo. I. E. NEWSON, *Sec.*

KENTUCKY VETERINARY MEETING

The Kentucky Veterinary Medical Association met at Shelbyville, Ky., June 20th and 21st. The program was opened with an invocation by Rev. W. R. Anderson, of Shelbyville. Mayor Rothchilds delivered the address of welcome. Dr. A. J. Payne, of the Bureau of Animal Industry, Louisville, spoke on the eradication of hog cholera, which subject was extensively discussed by the members present. Dr. H. Jensen, of Kansas City, presented an able address on blackleg, after which the members and visitors went on an automobile trip to the dairy farms around Shelbyville. A banquet was served at 6 p. m., Rev. Powell opening the program and Dr. R. C. Moore acted as toastmaster. Addresses were given by Dr. D. C. Henewatt, Dr. W. H. Simmons, Dr. R. McNeal, Dr. H. Jensen, Dr. S. F. Musselman, Dr. O. S. Crissler, Hon. O. M. Phillips and Hon. M. O. Sullivan.

On the second day, papers and addresses were presented by Dr. Joseph Hughes, Dr. H. Jensen, Dr. R. C. Moore and Dr. D. C. Henewatt. Dr. Hughes' address on the diagnosis of lameness was of especial interest.

A clinic was held in the afternoon, at which Dr. R. C. Moore performed several operations, assisted by Drs. A. S. Barnes, R. M. Hamilton, M. A. Purdy, and J. K. Ditto. Dr. Jos. Hughes discussed cases diagnosed at the morning session and also gave one of his inimitable chalk talks. Dr. H. Jensen fol-

For the Sake of Your Good Name

The Fort Dodge Serum Company has always felt the responsibility resting upon the serum producer. The very reputation of its customers is oftentimes dependent upon the company's integrity.

To safeguard OUR GOOD NAME we go to almost any length. To uphold the ideals in business for which our organization stands, we spare no efforts.

You, Mr. Veterinarian, food conserver par excellence, can rest assured that by protecting your GOOD NAME, we also protect ours.

U. S. Veterinary License No. 112.

"When better Serum is made, we'll make it."
"Ask the Doctor who uses it."

Fort Dodge Serum Company

Fort Dodge, Ia.

Des Moines, Ia. Lansing, Mich. Sheldon, Ia.

lowed with an address on contagious abortion, which was discussed by Dr. Good.

Owensboro, Ky. D. E. WESTMORELAND,
Sec.-Treas.

TEXAS VETERINARIANS MEET

The State Veterinary Medical Association of Texas held its seventh annual meeting at Fort Worth, Texas, June 14 and 15, 1917, at the medical department of Texas Christian University. Nineteen new members were admitted, and the association is upon a solid basis, with no debts and a substantial balance in the treasury.

There was one outstanding feature evident at this meeting and that was the good fellowship shown; every man there seemed to think it a part of his duty to see that every other had a good time and had a word of cheer and encouragement spoken to him. The veterinarians were welcomed to Fort Worth by Dr. C. C. Gumm, of the Chamber of Commerce of that city; a cordial welcome was extended and the freedom of the city given to the members of the association. Dr. C. D. Folse responded for the members in his usual happy way and assured the people of Fort Worth of our appreciation of their kindnesses and courtesies.

Dr. N. F. Williams, president of the association, next made a short address in which he reviewed the work that had been done, and spoke of what the association hoped to accomplish during the coming year. After these talks the association went into executive session, at which time the officers for the ensuing year were elected: Drs. N. F. Williams, president; W. G. Gregory, first vice-president; W. G. Brock, second vice-president; E .M. Wiggs, secretary-treasurer.

The program following was presented in excellent manner, and the discussion following each paper was spirited and to the point; much of value was brought out, and all received something good to take away with them.

Drs. R. C. Moore, A. T. Kinsley, R. F. Bourne, Frank Jones, Lester Smith, H. W. Hawley, G. G. Graham, and others were present and contributed materially to the presentation of papers and discussions. Mr. I. C. Brenner's paper, dealing with the "Veterinarian as Seen by a Commercial Traveler," was very instructive, showing what the other fellow is doing throughout the country, and how he conducts himself and his business. It was voted to invite outsiders to the meetings of the future, which should tend to establish a better understanding between the general public and the veterinary profession.

ERNEST M. WIGGS, D. V. M.,
Secretary-Treasurer.

PHILADELPHIA WANTS NEXT MEETING OF THE A. V. M. A.

The Pennsylvania State Veterinary Medical Association is soliciting the support and influence of members of the A. V. M. A. in behalf of Philadelphia as the meeting place for the association in 1918. Among the reasons given for holding the meeting there next year are, that it is particularly appropriate, that city being the cradle of liberty, the birth place of our nation, where our flag was designed, and since it is the recognized center of medical education of the world. It is further pointed out that Philadelphia has unexcelled transportation facilities and hotel accommodations; that it is equipped to take care of large conventions and hold clinics; that it is noted for its cordial entertainment of visitors; and that the A. V. M. A. has met there only once within almost a quarter of a century.

AN OPPORTUNITY FOR VETERINARIANS

The recent announcement by the United States government to the effect that there will shortly be a demand for federal employment of some 2,500 veterinarians, distributed in the Reserve Army Veterinary Service and Bureau of Animal Industry and the indications that this demand for men trained in the veterinary profession will be even greater in the immediate future, has influenced those in authority at the Michigan Agricultural College to undertake to broaden its scope of instruction and to include work both for practicing veterinarians and students in veterinary medicine. While it is not intended to in any way curtail the scheduled courses for veterinary students, recent action by the state board of agriculture opens a way for giving a special summer school course to senior veterinary students with a view to graduating them on or about April 10, 1918, thus enabling them to complete their professional studies and be prepared for earlier entrance into the field opened by our entrance into the war. Under this plan it is proposed to begin the regular senior year work of the veterinary course on August 27th and the college is now arranging to admit not only students from other institutions should they desire to take up this work, but also, to make it possible for practitioners to qualify for this work.

Admission into this work will be arranged under two phases. Graduates and undergraduates will be allowed to enter as members of the fourth year class if they can present the necessary educational qualifications for admission to the college and pass satisfactory examinations for all work in which they desire advanced credit, or otherwise offer certificates indicating they have satisfactorily

There is a Mighty Good Reason why we make

Only

Carotid Bled Serum

You want the Best
Then Order from

An Old Established Firm

Office 465 Live Stock Exchange
KANSAS CITY, MO.

It will satisfy your most exacting customer

No Kicks! ***No Complaints!***

SUCCESS and MONEY
BIG O MEANS BOTH

Prices Entirely Right *Order from Us Now*

completed the work in some other veterinary school whose entrance requirements and course of study are equivalent to those of this college. Applicants entering under this arrangement after one year of residence, and satisfactorily completing the regular senior year's work will receive the college degree.

Graduates unable to qualify as above and who desire to pursue special studies, or who wish to add to their personal knowledge will be admitted into the regular class work of the senior year or permitted to elect any other of the undergraded subjects, which they may desire, and which are regularly taught during their period of residence. They will be given all the opportunities and facilities offered regular students in so far as these opportunities do not interfere with the instruction to regular students. This work will be offered without any tuition to residents of Michigan other than the regular matriculation fee of $5.00, and laboratory fees should they elect work where such fees are authorized.

The subjects that will be offered as the regular senior class work are the courses of clinic, parasitology, medicine, pathology of infectious diseases, meat inspection, therapeutics, special and operative surgery, obstetrics and lameness and soundness; also underclass subjects regularly scheduled in the college catalog.

In giving this work to veterinarians who do not enter under the regular college entrance requirements this college does not contemplate granting a degree or certificate, but contemplates giving the work entirely for the benefit that may be derived from the increased knowledge of veterinary science.

R. P. LYMAN, *Dean.*

The International Products Co., with $5,000,000 capital, has been formed to carry on cattle and leather trade with South America.

Dr. W. J. Parker, of Grand Meadow, Minn., was instantly killed when his auto swerved into a ditch and turned turtle near Austin, Minn., July 13th. Dr. Parker was en route home from Lake City, where he had attended the Minnesota-Wisconsin joint meeting, at the time the accident happened. He was a member of the 1912 Chicago Veterinary College class. His home was in Chicago, to which city his remains were taken for burial.

Dr. Clarence J. Marshall, State Veterinarian of Pennsylvania, submitted to a delicate operation for throat trouble at the Jefferson hospital in Philadelphia, July 20th. He rallied well following the ordeal and his early recovery is expected.

Ralston Serum=Safety Serum

A Reliable Product for the Veterinarian

Ralston Serum Company

Long Distance Phones
Day, Ralston 85
Night, South 857

Ralston, Nebraska
5 Miles West of Omaha

DR. L. B. GRAHAM, President and Gen. Manager
W. J. MENARY, Treasurer
DR. J. W. GRIFFITH, Secretary

Cedar Rapids Serum Company (Inc.)

Producers of Highly Potent and Reliable

Anti-Hog Cholera Serum

For Simultaneous Treatment

U. S. Veterinary License No. 40.

None Distributed Unless Proven of High Potency

Cedar Rapids, Iowa

Veterinary Medicine Series

A Selected Book Shelf for Veterinarians

No. 1.	**Springtime Surgery** Compiled by D. M. Campbell, D. V. S.	$1.00
No. 2.	**Poultry Diseases and Their Treatment** By B. F. Kaupp, M. S., D. V. S.	1.50
No. 3.	**Colics and Their Treatment** By E. L. Quitman, V. S., M. D. C., and others.	1.25
No. 4.	**Swine Diseases** By A. T. Kinsley, M. S., D. V. S.	2.25
No. 5.	**Canine Medicine and Surgery** By Maj. Chas. G. Saunders, V. S., B. V. Sc.	2.25
No. 6.	**Special Veterinary Therapy** By Mart R. Steffen, V. S., M. D. C.	1.00
No. 7.	**Special Cattle Therapy** By Mart R. Steffen, V. S., M. D. C.	1.50
No. 8.	**Animal Castration** By J. V. Lacroix, D. V. S.	1.50
No. 9.	**Wound Treatment** By L. A. Merillat, V. S., and others.	1.50
No. 10.	**Essentials of Veterinary Law** By H. B. Hemenway, A. M., M. D., LL.B.	3.00
No. 11.	**The Itinerant Horse Physician** By Mart R. Steffen, V. S., M. D. C.	1.50
No. 12.	**Sheep Diseases** By E. T. Baker, D. V. M.	2.50

SPECIAL OFFER

All twelve books of the series ordered at one time

$17.50
Prepaid

American Journal of Veterinary Medicine
9 South Clinton Street
Chicago, Ill.

Dr. R. J. Hight was recently appointed State Veterinarian of Arizona, by Governor Campbell, to succeed Dr. W. E. Severn, who has held the office for the past five years. Dr. Hight graduated from the Chicago Veterinary College in 1907 and for several years prior to coming to Arizona was Assistant State Veterinarian of Illinois.

To discourage the killing of females of all species of animals and fowls during the war, the commissioner of agriculture of Kentucky has organized a state pure-bred live stock association.

A bill was recently passed in Illinois making it a misdemeanor to forge the name of a veterinarian, physician or dentist to a prescription or order.

Five veterinarians were licensed recently by the Oregon state veterinary board. The men in the order in which they passed the examination are: Dr. James N. Shaw of Portland, Dr. Herbert J. Moncrief of Haines, Dr. Fred W. Miller of Corvallis, Dr. Austin Ragle of Baker, and Dr. O. L. Hollfield of Willamina. Dr. E. T. Notz of Baker was elected secretary of the board, and Dr. Robert Hunt of Roseburg, president.

Dr. J. W. Reeder, city meat and milk inspector for fifteen years at Sandusky, Ohio, resigned June 22, and entered the Bureau of Animal Industry service at Richmond, Va., June 30.

The Jay and Randolph County Veterinary Association held a meeting and picnic at Geneva, Ind., July 4.

Dr. W. H. Gruner and Dr. G. J. Behrens of Evansville, Ind., have been appointed stock inspectors at the stock receiving stations in that city. With a view of conserving the future meat supply, the inspectors are to prevent the slaughter of pigs before maturity.

Dr. Benjamin A. Moore and Miss Golda Gardner were married at Kansas City, Mo., June 23. Dr. Moore is a member of the 1916 class of the Kansas City Veterinary College and is now established in practice at Fremont, Neb.

The Mississippi live stock sanitary board

BACTERINS

B. Abortus Vaccine, for the protection of bovines against B. Abortus (Bang).

Canine Distemper Prophylactic, for the prophylaxis of canines against B. Bronchisepticus (B. Bronchicanis).

Canine Distemper Vaccine, for the treatment of distemper occasioned by B. Bronchisepticus (bronchicanis), streptococcus, staphylococcus and B. Coli.

Calf Scour Vaccine, for the prevention and treatment of white scour or Pneumonia in calves due to B. coli, B. paracoli and B. enteritidis.

Hemorrhagic Septicemia Vaccine, for the prophylaxis and treatment of this condition in cattle due to B. Bovisepticus.

Pneumo-Strep Vaccine, for the treatment of Pneumonia, Pleurisy, etc., due to these micro-organisms.

Pneumo-Staph-Strep Vaccine (Influenza Vaccine—Improved). Particularly indicated for the prophylaxis and treatment of Equine Influenza—in vials and in syringes.

Staph-Strep-Coli Vaccine (Anti-Suppurine), for the treatment of suppurative conditions.

Staph-Strep-Coli-Pneumo Vaccine (Polyvalent Mixed Bacterin). For the prophylaxis and treatment of numerous and various infectious conditions. A most useful Bacterin—supplied in syringes.

Streptococcic Vaccine, for the treatment of conditions due solely to the streptococcus.

We also furnish Black Leg Vaccine and Serum; Anthrax Vaccine and Serum; Calf Scour Serum; Streptococcus Serum; Influenza Serum; Tetanus Antitoxin, etc. Please write for List and Literature.

THE CUTTER LABORATORY OF ILLINOIS

(Established as The Sorby Vaccine Company in 1908)

180 NORTH DEARBORN STREET CHICAGO, ILLINOIS

G. I. Blanchard, DVS
President

E. B. Hollecker, DVS
V. P. & Lab. Supt.

Conserve the Hog Supply

There can be no question about saving the hogs if our carotid serum and virus are used.

Manufactured in a strictly modern plant by pioneer Veterinarians.....

We invite the Veterinarians attending the annual meeting of the A. V. M. A. to visit our plant while in Kansas City.

Price, $1.25 per 100 CC. Virus QS, free.

Produced Under U. S. Veterinary License No. 23

Send Your Orders to the Nearest Distributing Agency

Dr. H. G. White, Kokomo, Ind.
Dr. A. A. Mull, Rushville, Ind.
Dr. G. J. Behrens, 610 S. Third St., Evansville, Ind.
Dr. A. G. Alverson, Bloomington, Ill.
Drs. Howe & Edwards, 636 E. Grand Ave., Des Moines, Iowa.
W. A. McNeill, Rives, Tenn.
Dr. T. W. Johnston, 646 N. Main St., Dayton, Ohio.
Dr. G. H. Conn, 311 Croghan St., Fremont, O.
Dr. A. G. Wadleigh, La Junta, Colo.
Dr. N. J. Mayer, Mitchell, So. Dak.
Dr. W. L. Edwards, Visalia, Calif.

Missouri Valley Serum Company

809 Live Stock Exchange Bldg. **KANSAS CITY, MO.**

has requested the Bureau of Animal Industry to assign a veterinary inspector to make a study of swamp fever, which is prevalent among mules and horses in certain parts of the state.

Dr. Charles Bates of Brant, Mich., paid a fine and costs amounting to $21 for practicing without a license, June 25.

Dr. George A. Webber, a former well-known veterinarian of Cambridge, Mass., died June 25. He had been an invalid for many years. He was born in Cambridge fifty-six years ago and was graduated from Harvard.

Dr. Walker T. France of Oakland City, Ind., was bitten on the hand by a rabid horse recently, and is taking the Pasteur treatment at Indianapolis.

Dr. W. E. Hastings of Mount Vernon, Ind., has been conducting experiments in producing the zebroid, a hybrid of an American mare and a zebra. He has succeeded in getting one foal from the mating. Dr. Hastings believes the zebra will give bigger bone to its offspring, the foal will be less subject to sickness, its tough skin will resist the attack of flies and its average age will be doubled.

The Capital Veterinary Association was organized at Lansing, Mich., June 28, with fifty charter members. Officers elected were: President, Dr. R. E. Rice, Maple Rapids; vice-president, C. A. Spencer, Fowlerville; secretary-treasurer, W. T. Chamberlain, East Lansing. The organization is composed of veterinarians from Ingham, Eaton, Clinton, Shiawassee and Livingston counties, Michigan. Dr. R. P. Lyman and Dr. G. W. Dunphy gave short talks at the meeting.

The Nebraska live stock sanitary board designated July 19 as vaccination day and called upon all owners of hogs in the state to have their animals vaccinated against hog cholera on that date. Veterinarians were asked to donate 50 per cent of their fees.

Dr. A. V. Jandernoa of Fowler, Mich., and Miss Betty Beauchampet were married at the bride's home in Grand Rapids, Mich., June 5. The couple left for a short wedding trip to Detroit. They will make their home at Fowler.

J. F. McANANY, President and Manager DR. L. E. SCELI, D.V.M., Director of Laboratories

Grain Belt Anti-Hog Cholera Serum

is produced in a modern equipped laboratory, operated under U. S. Veterinary License No. 84. Our endeavor is to produce every c.c. of Serum and Virus of a uniform standard quality, and to give our customers the best possible attention and service.

Grain Belt Supply Company

Live Stock Exchange Bldg.
Omaha, Neb.

Phones: Office, South 3554
Laboratory, South 3569

Night Phone:
Harney 4000

Dayton, O., July 16, 1917

Mr. Veterinarian:

I thank you very much for the interest taken in the matter of a "COUNTRY RENDERING PLANT." Three consecutive numbers of this JOURNAL have carried the "AD." Mr. Letter Carrier was on the jump. So was MORRISON. DAYTON is a live town and we have plenty of Carriers as well as Stenographers. Thanks for your orders. You boys who are thinking about getting into the business had better hurry. I am here to give you information. My object is to furnish you up-to-date rendering machinery that will make fine Hog Food, and at the same time be sanitary.

WILLIAM G. MORRISON

DAYTON, OHIO, U. S. A.

Gould and Pyle's Pocket Medical Cyclopedia

Gould and Pyle's Pocket Cyclopedia of Medicine and Surgery, 2nd Edition revised, is a concise, practical volume of over 700 pages containing a vast amount of information on all medical subjects, including many useful tables for reference, etc. It is admirably adapted to the needs of those who frequently run across medical terms that are not easily understood. Everything really essential has been included and the text is printed on strong paper, clear type and bound in full, flexible leather, gilt edges, round corners. Price $1.25, or with Thumb Index $1.50 Postpaid.

P. Blakiston's Son & Co.

1012 Walnut St., Philadelphia

Ideal Iodine

WHY should **IODUM-MILLER**, the soluble Iodine, have a SPECIAL PLACE in the hand-bag or emergency case of EVERY DOCTOR?

BECAUSE as a first aid dressing to injury of any kind it has no superior.

BECAUSE it is always ready for use.

BECAUSE it is always the same strength.

BECAUSE it has great germicidal power.

BECAUSE it is more efficient as a germicide than iodine tincture.

BECAUSE it does not irritate to the extent that iodine tincture does, and when applied to the surface it is absorbed into the deep tissues.

BECAUSE it is soluble in water and under no circumstances will precipitate elementary iodine.

BECAUSE it is better tolerated by the stomach than any iodide and in specific conditions it can be carried to large doses.

BECAUSE one dram in an ounce of water a half hour before feeding gives a better therapeutic effect than 60 gr. potassium iodide.

BECAUSE it has a germicidal action on the body tissues and potassium iodide has not.

BECAUSE it is for external, internal, hypodermic or intravenous use, and however used it gives all of the best action of iodine.

BECAUSE it is a germicide, an alterative, a tonic and a reconstructor of diseased tissue.

BECAUSE doctors find these statements true. (They say they get the results they want.)

Each doctor may test it for himself. Free sample on request.

MANUFACTURED EXCLUSIVELY BY

THE IODUM-MILLER CO.

533 Ridge Bldg., Kansas City, Mo., U. S. A.

The Southern Illinois Veterinary Medical and Surgical Association will meet at Centralia, Ill., August 7 and 8.

Dr. Leroy Dietriech, formerly of Dewey, Okla., has taken over the hospital and practice of Marney Bros., at Wichita, Kans.

The Iowa state board examination was held in Des Moines, July 5 and 6. Seventy-eight graduate veterinarians took the examination. The applicants were addressed by Governor Harding, State Veterinarian Gibson and G. D. Ellyson of the Standard Chemical Co. On Friday evening they were entertained at dinner at the plant of the Standard Chemical Co.

Dr. J. S. Craft has located at Albia, Ia.

Dr. O. C. Schwalm is in practice at New Douglas, Ill. He states he is doing a nice business and is well satisfied.

The fourth annual convention of the National Association Bureau of Animal Industry Employes, will be held at Omaha, Neb., in the Hotel Rome, beginning August 13 Invitations have been extended to several congressmen and others prominent in public life to attend the convention. Elaborate arrangements are being made for the entertainment of the delegates and visitors.

Mrs. Rhoda Miller, wife of Dr. James M Miller, of St. Joseph, Mich., died May 8 after a long illness. Dr. Miller feels the loss very keenly as she was his constant companion even while he was attending veterinary college, and many of his classmates will no doubt recall her and how devoted she and Dr. Miller were to each other. Dr. Miller attributes a great deal of his success to her help. They were married eight years ago. She was 44 years old and for four months preceding her death had suffered from heart trouble

Dr. J. A. Jensen, McKillip, 1916, has entered into partnership with Dr. C. R. Diller of Marshalltown, Iowa.

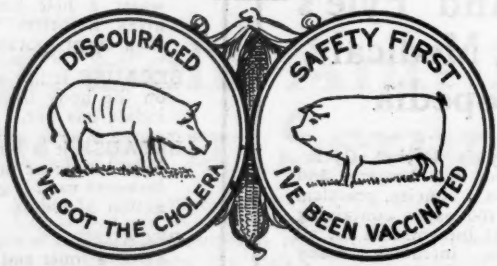
Thirty members of the junior class of the Iowa State College at Ames are continuing their studies through the summer. They will graduate in April, 1918, three months in advance of the regular commencement date. The heavy immediate demand for veterinarians, especially for army service, is given as the reason for the extra summer session.

F. J. RATHMAN
Sec'y & Treas.

J. M. CORY
President

H. F. HUNT, D. V. M.
Chief Veterinarian

None but the Best



We Strive to Please

The Southwestern Serum Company

Wichita, Kansas

Producers of

Highly Potent Anti-Hog Cholera Serum

U. S. Veterinary License No. 56

Branch—OKLAHOMA CITY, OKLAHOMA

M. L. CRANS, D. V. M.
Vet. in Charge

Oklahoma Permit No. 8
Live Stock Exchange Bldg.

Veterinary Account Book

A Journal, Day Book and Ledger All in One and of a Size to Fit Your Pocket

So simple that any one can understand it, and at the same time it meets every legal requirement and furnishes all necessary information.

Accounts may be kept in this book with the expenditure of less time and labor than by any other adequate system. Yet a complete record of every account is always with the doctor and instantly ready for presentation when an opportunity for collection arises.

This is an account book and nothing else; no space is taken up with tables of weights and measures, dosage, poisons and antidotes or other extraneous matter.

It contains a chapter on "Fees," by Dr. D. M. Campbell, Editor of the AMERICAN JOURNAL OF VETERINARY MEDICINE, that constitutes a valuable guide to the young practitioner in making charges and furnishes important data to the established practitioner who feels that rising cost necessitates a **revision of his scale of fees.**

This book contains also a chapter on "Collections," by Dr. Campbell, in which the writer gives at length the principles of prompt collections, and describes fully methods for collections that have proved successful with him in large and small practices and from both a farm and a city clientele. It is an eminently practical article and should enable any veterinarian whose collections are not satisfactory to increase the percentage of his collections and hold his patrons more firmly.

A FEW POINTS OF SUPERIORITY

1. Every entry is an "original entry," and therefore, meets all legal requirements in case of suit.
2. The name and address of each client is under your eye each day; no one can be overlooked.
3. Current charges for each day can be entered in a very few minutes.
4. No ledger is required. Each client's account is complete on one page. No "posting" is necessary.
5. By this method, each account must appear daily exactly as it stands, and all in one place.
6. The time required for entering charges and credits will not exceed ten seconds a day for each service.
7. No "cipher code" or other hieroglyphics is required.
8. Use may begin at any time, with no loss of space, and book is good until filled.
9. Absolute simplicity. No explanation is necessary.
10. The ease and rapidity with which entries are made ensures their being made. This point will be appreciated by the busy practitioner.

We guarantee this book to be satisfactory and will refund the price without question to any purchaser who is not satisfied.

FLEXIBLE LEATHER BINDING

Price: Water Grain Cowhide.....$1.25
Goat skin, morocco (blue), with purchaser's name in gold letters..... 2.00

American Journal of Veterinary Medicine

9 S. Clinton St., Chicago, Ill.

Dr. L. E. Northrup of Indianapolis, was appointed state veterinarian of Indiana, July 2, to succeed Dr. A. F. Nelson of Lebanon, who recently resigned. Dr. Northrup's term will extend to March, 1921. Dr. Northrup was in the government veterinary service before coming to Indianapolis in 1908. Since that time he has been connected with the state department as an assistant.

The fourth annual meeting of the Western New York Veterinary Medical Association was held at Buffalo, N. Y., June 28. Papers were read by Dr. J. V. Hills of Gowanda, Dr. F. E. McClelland of Buffalo, Dr. Edward Rafter of Hamburg, Dr. A. Crowforth of Lockport, and Dr. F. F. Fehr of Buffalo. A clinic was held at which many interesting cases were presented. The following officers were elected: Dr. J. L. Wilder of Akron, president; Dr. W. E. Frank of Batavia, vice-president; Dr. F. F. Fehr of Buffalo, secretary-treasurer.

Dr. H. L. Ragsdale of Novelty, Mo., and Dr. R. E. Snedden of Kent, Ohio, reported for duty with the Bureau of Animal Industry at South St. Joseph, Mo., July 9.

The semi-annual meeting of the South Dakota Veterinary Association was held at Huron, S. D., June 29 and 30. About fifty veterinarians were present, including Dr. Phelps of Pierre, state veterinarian. Several interesting papers were read and discussed, after which a clinic was held. The meeting closed with a banquet. The next session will be in December and will be held at Mitchell, S. D.

Contracts have been let by the army for the purchase of 2,000 horses at the National stock yards at East St. Louis.

Dr. Grantley Bickell, a veterinarian in the Massachusetts state bureau of animal industry, died at his home in Haverhill, Mass., July 9. He was 45 years old and was known throughout the state as a horseman and veterinarian. Before joining the state bureau seven years ago, he had been city veterinarian in Haverhill.

Five hundred sheep died near Nine Mile, Wash., during the early part of July. It is believed that their death was caused by eating lupine, which poisonous plant abounds in that region this year.

Dr. John L. Tyler of Pomona, Cal., has disposed of his practice to Dr. W. R. Oneal, formerly of Wayne, Neb., and later of Newman, Cal.

EUCAMPHINE

has a first-class reputation to sustain. If it could be made better, we would do so. The same care, the same high-grade ingredients are used in the preparation of **Eucamphine** as in years past.

Thousands of Veterinarians know the value of **Eucamphine** as an excellent Internal Antiseptic, and as an Antiferment, Antispasmodic and Antiperiodic. Also economical for External use.

1 gallon	$ 3.00
2 gallons	5.50
5 gallons	12.50

GUAIALYPTOL

For catarrhal conditions of the respiratory organs. You get Results—and it's a money-maker.

Write us about it.

Pint, $1.25; 5 Pints, $4.50; Gallon, $6.00

SODIUM CACODYLATE

For hypodermatic use when Arsenic is indicated. Alterative; Hematinic; General Tonic; reconstructive; highly endorsed by Quitman and others.

Package 12 ampoules, $2.25.

EUCO LINIMENT

A white, non-greasy, readily absorbed Liniment whose appearance and properties will please the most exacting Veterinarian.

1 gallon, $1.50; 5 gallons, $6.25

THE EUCAMPHINE CO. **180 N. Dearborn St.** **CHICAGO**

Pacific Coast Distributors:
J. Theo. Erlin Co.,
San Francisco, Cal.

Eastern Distributors:
R. J. Strasenburgh Co.,
Rochester, N. Y.

Make Our Office Headquarters During The A. V. M. A. Meeting

YOU ARE WELCOME

Our location is 10 blocks north of Union Station at 1320-22 Main Street, only three blocks from hotel headquarters.

Have your mail and other urgent messages sent in our care.

The JEN-SAL Laboratories

offer a complete line of veterinary supplies

Pharmaceutical Specialties
Biological Products
Surgical Instruments
Veterinary Text Books
Hospital Supplies
Drugs and Chemicals

The JEN-SAL Staff

H. Jensen, Ph. G., D. V. M.
C. E. Salsbery, D. V. M.
G. G. Graham, D. V. M.
Frank Breed, D. V. M.
C. J. Norden, D. V. M.
H. J. Jensen, Ph. G.

ASSOCIATION MEETINGS

The information given below is up-to-date and has been furnished by the secretaries of the various associations listed.

Secretaries are requested to supply us data regarding their associations after each meeting; otherwise, the association will necessarily be dropped from the list. We ask secretaries to kindly co-operate with us in keeping before the members of their associations the date and place of the next meeting.

Name of Association	Date of Meeting	Place of Meeting	Secretary
Alabama Vet. Med. Assn.			C. A. Cary, Auburn, Ala.
Alumni Assn., Col. of Vet. Med., O. S. U.		Columbus, O.	W. R. Hobbs, O. S. U., Columbus, O.
Alumni Assn., N. Y. State Vet. College		New York	P. K. Nichols, Port Richmond, N. Y.
Alumni Assn., U. S. Col. Vet. Surg.	April 1918	Washington, D. C.	Chas. M. Mansfield, 1344 Newton St., Washington, D. C.
American Vet. Med. Assn.	Aug. 20-24, 1917	Kansas City, Mo.	L. A. Merillat, 1827 Wabash, Chicago.
Arkansas Vet. Med. Assn.	Jan. 1918	Little Rock, Ark.	R. M. Gow, Little Rock.
British Columbia Vet. Assn.	Sept. 21, 22, 1917	Penticton, B. C.	Kenneth Chester, New Westminster, B. C.
B. A. I. Vet. Assn. of So. Omaha	4 times a year	So. Omaha, Neb.	J. W. Giffee, c/o B. A. I., So. Omaha
California State Vet. Med. Assn.		San Francisco, Cal.	F. M. Hayes, Davis, Cal.
Central Canada Vet. Assn.	3rd week Jan. 1918	Ottawa, Ont.	A. B. Wickware, Experimental Farm, Ottawa.
Central N. Y. Vet. Med. Assn.	Last week in June and Nov.	Syracuse, N. Y.	W. B. Switzer, Oswego, N. Y.
Chicago Vet. Society	2nd Tues. of month	Chicago, Ill.	A. A. Leibold, 4421 N. Lincoln St., Chicago.
Colorado Vet. Med. Assn.	January, 1918	Ft. Collins, Colo.	I. E. Newsom, Ft. Collins, Colo.
Conestoga Veterinary Club.	2nd Thurs. of month	Lancaster, Pa.	H. W. Barnard, 529 E. King St., Lancaster, Pa.
Connecticut Vet. Med. Assn.	Aug. 8	Bristol, Conn.	A. T. Gilyard, Waterbury, Conn.
Eastern Iowa Vet. Med. Assn.	Dec. 12	Muscatine, Ia.	Jno. Tillie, Muscatine, Ia.
Genesee County Vet. Med. Assn.			W. J. Houden, Flint, Mich.
Genesee Valley Vet. Med. Assn.	July	Rochester, N. Y.	I. R. Taylor, Henrietta, N. Y.
Georgia State Vet. Assn.	Sept. 18, 19, 1917	Columbus, Ga.	Peter P. Babnsen, Capitol Bldg., Atlanta.
Hendricks Co. Vet. Med. Assn.	First Tues. of month	Pittsboro, Ind.	T. R. Irons, Pittsboro, Ind.
Hudson Co. Vet. Practitioners' Club.	Monthly	Jersey City, N. J.	B. D. Blair, 782 Montgomery St., Jersey City, N. J.
Hudson Valley Vet. Med. Society	Aug. 1	Chatham, N. Y.	Wm. Henry Kelly, Albany, N. Y
Idaho Assn. of Vet. Graduates		Boise, Idaho	C. V. Williams, Blackfoot, Idaho.
Illinois State Vet. Med. Assn.		East St. Louis, Ill.	L. A. Merillat, 1827 Wabash Ave., Chicago
Illmo Vet. Med. Assn.		Collinsville, Ill.	L. R. McKinley, Freeburg, Ill.
Indiana Vet. Med. Assn.	Jan. 1918	Indianapolis, Ind.	Geo. H. Roberts, Indianapolis, Ind.
Iowa Vet. Med. Assn.		Ames, Iowa	R. B. Treman, Rockwell City, Ia.
Kansas Vet. Med. Assn.		Wichita, Kan.	J. H. Burt, Manhattan, Kan.
Kentucky Vet. Med. Assn.	Sept. 13, 14, 1917	Lexington, Ky.	D. E. Westmoreland, Owensboro, Ky.
Keystone Vet. Med. Assn.	2nd Tuesday of month	Philadelphia	L. B. Davis, 857 E. Girard, Philadelphia.
Lake Erie Vet. Med. Assn.	1st Tuesday in Dec.	Norwalk, O.	N. D. Backus, Elyria, O.
Los Angeles Vet. Med. Assn.	3rd Wed. of month	Los Angeles	J. A. Dell, 16th & Pacific, Los Angeles.
Maine Vet. Med. Assn.		Bangor, Me.	M. E. Maddocks, Augusta, Me.
Manitoba Vet. Assn.		Winnipeg, Man.	W. Hilton, 275 James St., Winnipeg.
Massachusetts Vet. Assn.	4th Wed. each month	Worcester in Sept.; Boston rest of year.	E. A. Cahill, Boston, Mass.
Michigan State Vet. Med. Assn.	1st Tues. & Wed. after 1st Mon. in February.	Lansing, Mich.	W. Austin Ewalt, Mt. Clemens, Mich.
Minnesota State V. M. Assn.	July 11, 12, 13	Lake City, Minn.	G. Ed. Leech, Winona, Minn.
Mississippi State Vet. Med. Assn.	January 8-9, 1918	Meridian, Miss.	E. S. Norton, Greenville, Miss.
Mississippi Valley Vet. Med. Assn.	July 6, 1917	Galesburg, Ill.	W. Lester Hollister, Avon, Ill.
Missouri Valley Vet. Assn.		St. Joseph, Mo.	R. P. Bourne, 1230 E. 15th, Kansas City.
Missouri Vet. Med. Assn.	Last week in July	Neosho, Mo.	C. D. Foiss, 1230 E. 15th St., Kansas City
Montana Vet. Med. Assn.	Sept. 26-27, 1917	Helena, Mont.	A. D. Knowles, Missoula, Mont.

Purity Anti-Hog Cholera Serum

is

Pure, Potent and Always Dependable

In 1916 we produced almost 1/7 of all serum made under U. S. Government Supervision. We are now producing about 5,000,000 c.c's per month and we have no serum over four weeks old on hand.

Price: 1¼ cents per c.c. Special prices on large orders.

Germ Free Blackleg Vaccine

(IMMUNO)

All products made under U. S. Veterinary License No. 39.

Send for booklets: { "Hog Cholera and Its Prevention." / "Blackleg and Its Prevention."

PURITY BIOLOGICAL LABORATORIES

SIOUX CITY, IOWA

W. O. SERUM
None Better

PRODUCED ON OUR OWN FARM.

Our new $50,000.00 plant equipped
to insure Sanitation.

Prices on Request.

United States Veterinary License No. 10.

Wichita-Oklahoma Serum Co.

Wichita, Kans. Oklahoma City, Okla. Nashville, Tenn.

Uniform in Potency ***Uniform in Price***

Uniformly Used, Once Introduced

Made only from CAROTID BLEEDING

Tested down to 10 cc's per pig in all tests.

All users have utmost confidence in "Red Heart" Serum.

No order too small to receive our most careful attention.

We solicit the Veterinary profession only.

U. S. Veterinary License No. 116. Iowa State Permit No. 75.

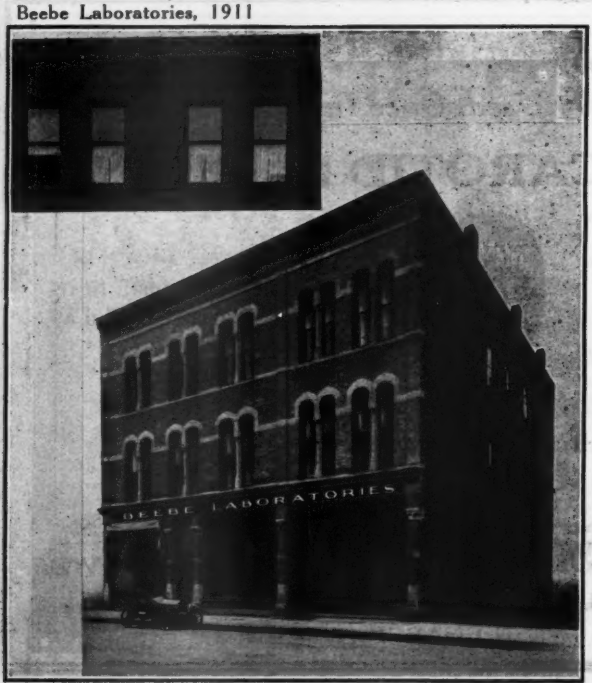
OTTUMWA SERUM CO., Ottumwa, Iowa

MAJOR T. P. SPILMAN, Manager DR. G. H. GILLETTE, Chief Veterinarian

Name of Association	Date of Meeting	Place of Meeting	Secretary
Nat'l Assn. B. A. I. Employees	2nd Mon. in Aug., 1917.	Omaha, Neb.	S. J. Walkley, 185 N. W. Ave., Milwaukee.
Nebraska Vet. Med. Assn.	2nd Tues. & Wed. in Dec.	Lincoln, Neb.	S. W. Alford, Lincoln, Neb.
New York State Vet. Med. Society	July 25, 26, 27	Brooklyn, N. Y.	C. P. Fitch, Ithaca, N. Y.
North Carolina Vet. Med. Assn.		Charlotte, N. C.	J. P. Spoon, Burlington, N. C.
North Dakota Vet. Assn.	July, 1917	Fargo, N. D.	W. J. Mulreony, Havana, N. D.
Northeastern Indiana Vet. Assn.	Oct. 9, 1917	Ft. Wayne, Ind.	R. M. Boyd, Avilla, Ind.
Northwestern Ohio Vet. Med. Assn.	Feb. 21	Toledo, O.	Paul E. Wood, Ottawa, Ohio.
Ohio State Vet. Med. Assn.	Jan. 10, 11, 1918	O. S. U. Columbus, O.	F. A. Lambert, care O. S. U., Columbus.
Ohio Valley Vet. Med. Assn.	July	Oakland City, Ind.	C. S. Henry, Terre Haute, Ind.
Oklahoma State Vet. Med. Assn.	May 3, 4	Oklahoma City	R. C. Smith, Enid, Okla.
Oregon Vet. Med. Society		Probably Salem, Ore.	B. T. Simms, Corvallis, Ore.
Pennsylvania State Vet. Med. Assn.		Harrisburg, Pa.	E. H. Yunker, 2344 N. 18th, Philadelphia.
Rhode Island Vet. Med. Assn.	2nd Tues. Jan.		U. S. Richards, Woonsocket, R. I.
Schuylkill Valley Vet. Med. Assn.		Reading, Pa.	C. R. Potteiger, Reading, Pa.
South Dakota Vet. Med. Assn.	July	Watertown, S. D.	S. W. Allen, Watertown, S. D.
Southeastern States Vet. Med. Assn.	Dec. 27, 28, 29, 1917	Chattanooga, Tenn.	G. A. Roberts, West Raleigh, N. C.
Southern Aux. Cal. State Vet. Med. Assn.		San Francisco	J. A. Dell, 16th & Pacific, Los Angeles.
S. W. Michigan Vet. Med. Assn.	Aug. 31	Indian Lake, Mich.	L. A. Minter, Niles, Mich.
Tenn. Vet. Med. Assn.	Nov. 7, 8, 1917	Columbia, Tenn.	F. R. Youree, Lebanon, Tenn.
Texas Vet. Med. Assn.		Ft. Worth, Tex.	E. M. Wiggs, Greenville, Texas.
Tri-County Vet. Med. Assn.	March 14	Liberty, Ind.	Geo. G. Ferling, Richmond, Ind.
Twin City Vet Med. Society	Once a month	St. Paul	C. C. Palmer, St. Paul, Minn.
U. S. Live Stock Sanitary Assn.		Chicago	H. S. Ward, St. Paul, Minn.
Utah Vet. Med. Assn.		Logan, Utah	E. P. Coburn, Brighton City, Utah.
Veterinary Assn. of Saskatchewan		Regina, Sask.	R. G. Chasmar, Hanley, Sask.
Vet. Med. Assn. of New Jersey		Asbury Park, N. J.	H. L. Loblein, New Brunswick, N. J.
Vet. Med. Assn. of N. Y. City	1st Wed. ea. mo. except July, Aug., Sept.	New York City	E. S. MacKellar, 351 W. 11th St., N. Y.
Vet. Med. Assn. of Geo. Washington Univ.	1st Sat. each month	Washington, D. C.	C. W. Rippon, 2115 14th St., N. W., Washington, D. C.
Vet. Med. Society Wash. State College	1st and 2nd Tues. ea. mo	Pullman, Wash.	Claude Holden.
Virginia State Vet. Med Assn.		Norfolk, Va.	W. G. Chrisman, Blacksburg, Va.
Washington State Vet. Med. Assn.		Pullman, Wash.	Carl Cozier, Bellingham, Wash.
West Virginia Vet. Med. Assn.		Parkerburg, W. Va.	S. Layne, Huntington, W. Va.
Western Michigan Vet. Med. Assn.		Allegan, Mich.	J. S. McGuire, Grand Rapids, Mich.
Western N. Y. Vet. Med. Assn.	4th week, June, 1917	Buffalo, N. Y.	F. F. Fehr, 36 Prospect Ave., Buffalo.
Wisconsin Vet. Med. Assn.		Lake City, Minn.	W. A. Wolcott, Madison, Wis.
York Co. Vet. Med. Society	1st Tues. after 1st Mon. of each month	York, Pa.	C. S. Raustiekar, 335 Newberry, York, Pa.

Anthrax was reported from many sections of Mississippi during June and July, the milk supply of some cities having been cut off by quarantine on account of the prevalence of the disease. It is thought that the dry weather has been conducive to spread the malady, since the animals ingest the baccili when eating the grass so close to the ground. Anthrax was also reported to have made its appearance near Holbrook and Madison, Neb. The territorial veterinarian of Hawaii has sent information of extensive outbreaks of the same disease there and attributes its spread due to some human agent with malicious intent.

Beebe Laboratories, 1911



Beebe Laboratories, 1916

Beebe Laboratories

Established 1911
Incorporated 1915

Alkunux is rapidly replacing the bulky fluid extract of Nux Vomica with the large users. It contains all the active alkaloids produced from the "Nux Button."

Are you using it?

Prices

Liquid Form.

1 pt. (sufficient for 1 gal.).....$4.25

Tablets

100 2-dram tablets 1.40

100 1-oz. tablets.... 4.75

Beebe Laboratories

St. Paul, U. S. A.

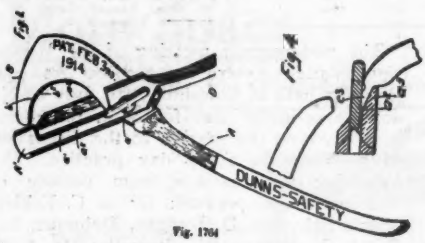


Fig. 1704

Aseptic, Safe and Powerful

Dunn's "Safety" Emasculator

With Beveled Recess

A Distinct Improvement over all others

Perfect Haemostasis is accomplished by **Dunn's Safety Emasculator,** by means of the beveled extension to crushing jaw. See Fig. 4—A3; by this means the cord is drawn into the space C3 as the male blade approaches the crushing edge A2, and is **gradually depressed** before the crushing is done, by which means is secured a thoroughly sealed end from which there can be no hemorrhage. It is made with curved handles; proportionately heavier and longer in the jaws; total length 13½ inches. Price $12.00.

Haussmann & Dunn Co.

Mfg. Dealers and Exporters of Veterinary Surgical Instruments, Text Books and Supplies

708 S. Clark St., Chicago, U. S. A.

Write for Catalogue

PEORIA SERUM CO.

Distributors of

Anti-Hog Cholera Serum

AND

Hog Cholera Virus

Produced under United States Veterinary License No. 10.

Sold to Veterinarians only.

Potency Not Sacrificed For Price,
Yet Prices Reasonable.

Prompt Service. Fair Treatment.

PEORIA SERUM CO., Peoria, Ill.

J. F. ROSER, D. V. S.,
IN CHARGE

Dr. Fay Swearingen of Sulphur Springs, Ind., died June 15 after being sick only six hours, the cause of death being attributed to autointoxication. Dr. Swearingen was a graduate of the Indiana Veterinary College in 1916.

Dr. W. A. Wolcott of Madison, Wis., is just recovering from an attack of anthrax infection contracted while inserting an improvised trachea tube into a heifer suffering from the disease. Dr. Wolcott probably owes his recovery to the prompt administration of anthrax serum in addition to the usual local treatment given in such cases.

State Veterinarian L. E. Northrup of Indiana, has announced the appointment of the following deputy veterinarians to assist him in his work: Dr. H. J. Kannel, Rensselaer; Dr. W. J. Armour, Goshen; Dr. Ed Leach, Ft. Wayne; Dr. O. G. Whitestine, Huntington; Dr. R. C. Julien, Delphi; Dr. G. M. Funkhouser, Lafayette; Dr. L. E. Scripture, Frankfort; Dr. J. S. Culbert, Portland; Dr. A. P. Helvie, Connersville; Dr. T. A. Walsh, Brazil; Dr. W. W. Scott, Vincennes; Dr. R. C. Applegate, Bloomfield; Dr. Haskell Lett, Seymour; Dr. J. L. Axby, Lawrenceburg; Dr. C. F. Pangborn, Charlestown; Dr. A. L. Marvel, Owensville.

The mid-summer meeting of the Mississippi Valley Veterinary Medical Association was held at Galesburg, Ill., July 6. No definite program was followed, the members devoting the session to the discussion of problems in every day practice. The following veterinarians from outside of Galesburg were present: Dr. G. C. Eckley, Monmouth; Dr. D. Drogan, Dubuque, Ia.; Dr. F. E. Brown, Blandinsville; Dr. J. H. Baker, Princeton; Dr. J. C. Shumm, Biggsville; Dr. M. F. Lair, Alexis; Dr. H. R. Hornbaker, Rockford; Dr. C. G. Brown, Peoria; Dr. W. F. Brownlee, Kirkwood; Dr. Fremont Peck, Wataga; Dr. Reed Salter, Stronghurst.

A driver at Washington, Cal., was fined $30 for beating his horse with a hatchet, May 14th.

Owing to the prevalence of rabies among wild animals in the vicinity of Goldfield, Nevada, the health department of that city ordered the indiscriminate slaughter of all dogs and cats within the city limits.

Aurora Safety Serum

Safe - Pure - Potent - Dependable

When you want to experience the results in using serum that you have always hoped for every time you have treated a herd of hogs, use Aurora Safety Serum and enjoy that satisfaction.

Not Just Serum But Serum of Quality

Made Right, Tested Right, Priced Right, Is Right.

It is better to use Aurora Safety Serum than to wish you had.

U. S. Veterinary License No. 125

Aurora Serum Company

Makers of Dependable Anti-Hog-Cholera Serum

Aurora, Illinois, U. S. A.

L. B. HUFF, D. V. S., Pres. and Mgr.
W. H. FITCH, Vice-President

A. C. HALL, Sec.-Treas.
W. J. PETERMAN, Laboratory Supervisor

More Space———for Instruments

The only suggestion for improvement during the two years of this Case's successful existence and here it is

Four 8 Oz. Bottles for liquids, glass stoppers with screw top
Four 2 Oz. Bottles for liquids, glass stoppers with screw top
One 2 Oz. Graduate
Two 8 Oz. Salt Mouth Bottles.
Four 4 Oz. Bottles for liquids, glass stoppers with screw top.
Large, roomy space 14½ in. long, 6½ in. wide and 2 in. deep. You can carry Dose Syringes, Capsules, Dressings, and all the minor operating instruments you may need.

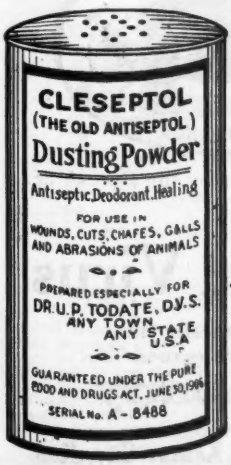
The New Improved I. V. A. Case

Just the right size, 15 x 7¾ x 7 inches.

COMPACT, HANDY AND PROFESSIONAL LOOKING

STURDY AND STRONG—made of Black Seal Leather with nickel trimmings. An emergency case with just the right number of bottles of sufficient capacity to carry drugs and ample room for enough instruments to meet the needs of the Busy Veterinarian.

Your check for $18.50 will bring it—Express Prepaid



Put up in 6 Oz. Sifting Top Cans. Always Dry and Ready for Use.

CLESEPTOL

The Satisfactory Dusting Powder
The Veterinarian's Money Maker

Antiseptic—Deodorant—Healing. Invaluable for cuts, abrasions, galls, etc.

The Formula—Calomel, Boric Acid, Camphor, Alum, Copper Sulphate and Carbolic Acid mixed with Pure Talcum.

YOUR NAME on the label here advertises You and brings you in a nice little income. Put up in gross and half-gross lots with your label.

Sold to the Profession Only

Costs the Veterinarian	14½c per can
Established Retail Price	50c per can
Profit to the Veterinarian	35½c per can

One gross, your label	**$18.75**
One-half gross, your label	**9.75**
One dozen, our label	**1.75**

The W. G. Cleveland Co.

"The Western House for the Western Doctor"

1410-12 Harney St. Omaha

A Manual of
POISONOUS PLANTS
By
Dr. L. H. Pammel
Professor of Botany, Iowa State College, Ames, Iowa

A very complete accurate and useful reference work. Part I contains ten chapters on the various plant poisons and their effects on man and animal, a classification of poisons, and other valuable information. Part II is an economic botany, covering practically the whole United States and giving the qualities and uses of practically all plants used by man. Appended is a catalogue of poisonous plants, a bibliography (50 pp.) and a full index.—**American Library Association Book List.**

The greatest work of its kind ever published—977 pages, numerous illustrations, 17 plates. Price, $7.50.

Special Offer

For a limited time I will supply readers of this Journal this work at $5.00 net, (sent prepaid for 35 cents extra), a saving of 33⅓%.

L. H. Pammel

Ames, Iowa

Several bills relating to livestock interests were recently introduced into the Wisconsin legislature. Among the provisions of this proposed legislation may be mentioned a maximum appraisal of $200 for cattle ordered slaughtered, of which 50 per cent may be paid by the state in indemnity; prohibition of the transportation or exhibition of diseased cattle, except when under state supervision; an annual appropriation of $18,000 for two years to provide area testing and for the dissemination of knowledge regarding tuberculosis; pasteurization of all by-products of the dairy. A bill requiring license for cats did not pass.

An employe in a steel foundry at East St. Louis, Ill., blistered his face with an acetylene torch, and died from anthrax two days later. He had previously worked at the stock yards among herds of sheep, and it was thought that anthrax germs remained on his clothing, which, coming in contact with the opened blisters, caused the infection.

Dr. Austin B. Byles, of Los Angeles, Cal., has issued a neat little folder, describing and illustrating his new dog and cat hospital, which is admirably equipped for treating and boarding canine and feline pets.

U.S. Veterinary License No. 103

Fowler's Serum

VETERINARIANS:—

The benefits of everything are best judged by the results.

We comply with every existing regulation prescribed by the Bureau of Animal Industry.

FOWLER Serum and Virus

are made by veterinarians who strive earnestly to maintain the eminence and good will we have earned.

Prompt attention given all orders.

Fowler Serum Company Kansas City, Kan.

Fowler Serum Can Be Had Direct, or Through Any Armour and Company Branch House.

QUALITY

We claim for our serum *superior* quality.

Our customers admit *superior* results.

Sioux Valley Serum Company

U. S. Vet. License 110 Iowa Permit No. 64

Specialists in Supplying Serum in Large Quantities

GUARANTEED TO GIVE SATISFACTION

M·A·C

Mistura Argenti Composita

Accepted and used by the Veterinary Profession since 1900

For Splints, Spavins, Curbs, Side Bones, Shoe Boils, Ossifications, Inflamed Tendons, Bursal, Lameness, Etc.

ADVANTAGES

Can be applied in a few seconds.
Does not soil the hands.
Does not blemish the horse.
Horse may be used every day.
Lower in price than imitations.
Guarantee label may be detached leaving only your name.

WE TAKE THE RISK

If "M-A-C" Fails on Fairly Selected Cases We Will Replace Your Loss.

PRICES

Single Bottle	$ 2.00
¼ doz. and one free	5.00
½ " " two "	8.00
1 " " four "	15.00
2 " " eight "	25.00

MANUFACTURED AND FULLY PROTECTED BY **CARTER-LUFF CHEMICAL CO.,** HUDSON, N. Y.

"VETERINARY PHARMACEUTICALS"

WRITE FOR OUR CATALOGUE

Customers in Canada will please order from the Wingate Chemical Co., Montreal

BLACKLEG FILTRATE

Lederle

Germ Free Concentrated

A New Effective Protection Against Blackleg

There is no disease of animals known in which prevention with biologics has been more widely applied than in blackleg. The good results which followed the introduction of protective inoculation are now being recognized throughout the United States and it may be safely stated that in blackleg districts a considerable proportion of animals are now being vaccinated annually. The available statistical data proves the remarkable reduction of losses from this disease, as a result of systematic vaccination.

The vaccine prepared in pellet or powder form is the outcome of early investigations on blackleg immunization by Arloing, Corvin, and Thomas, to whom the honor belongs of developing the method of immunization known as the "Lyon Method." The principle of this immunization consists in the attenuation of dried juices from blackleg lesions of an animal which has succumbed to the disease.

Kitt, in 1898, published the results of his experiments whereby he succeeded in simplifying the "Lyon Method"; his process requiring only a single injection, and he further recommended that it be made in the shoulder region where the skin is loose and easily pierced by the needle.

It must be accepted, however, that blackleg vaccine prepared in the usual pellet or powder form from attenuated blackleg meat is a comparatively crude product. Blackleg vaccine as marketed at the present time cannot be accurately standardized and a single dose may contain 100,000 or 1,000,000 spores and at other times a much smaller number. Such a variation would naturally result in irregularities of the immunizing action of the vaccine and it is no doubt due to this fact that direct losses from vaccination and deaths from the natural infection after vaccination cannot be entirely avoided. Nevertheless, blackleg vaccination as now practised has given splendid results, though complaints against the reliability of the method are now infrequent, both from veterinarian and stockman.

Realizing the shortcomings of the vaccine, investigators have been at work to develop a more uniform product which would avoid losses from vaccination and at the same time confer to the animals an effective protection against blackleg.

Attention was first directed toward developing a vaccine consisting of the attenuated cultures of the blackleg organism. Leclainche and Vallee developed a **liquid blackleg serum** which they tested out very extensively, and it is now being employed in different countries with fairly good results.

The shortcomings of the liquid blackleg vaccine must be recognized since it is subject to the same deficiencies as is the Pasteur vaccine for anthrax; viz., a careful standardization of the product is almost impossible; the keeping qualities of such a vaccine are limited; and furthermore, it is a recognized fact that the blackleg organism does not retain a uniform virulence upon artificial cultivation. These factors, no doubt, are responsible for the fact that the liquid blackleg vaccine is not attaining popularity for vaccination against blackleg.

With the advent of the development of the different immune sera for the prevention and treatment of diseases the utilization of animals for the production of **blackleg immune serum** has also been undertaken.

It is natural that the use of the serum for the control of blackleg has its limitations. The injection of an animal with serum induces a passive immunity which protects the animal for a period of less than one month.

BLACKLEG FILTRATE—LEDERLE

More recently in this country, **germ-free extracts (agressins)** have been highly recommended for immunization against blackleg, and the results from vaccination with this product are highly satisfactory and no doubt more reliable and uniform than with the blackleg pellets or with the powder. However, the cost of production of such extracts is considerable and therefore the stock owner, especially since he is accustomed to expend only a nominal sum for the products used heretofore for vaccination against blackleg, would not readily take advantage of this product.

Researches With Blackleg Filtrate—Lederle

Japanese investigators have recognized the value of immunization against blackleg with blackleg filtrate and developed the procedure to such a state of perfection that it is now almost uniformly employed in Japan.

Realizing the advantages which would follow the development of a potent blackleg filtrate, investigations were undertaken in our laboratories along the line of the Japanese method, especially since it appeared evident that a blackleg filtrate could be developed which, in its immunizing action would possess the same effectiveness as that obtained from the germ-free extract, juices of meat taken from animals affected by blackleg.

It would be impossible to describe in this short article, in detail, the method of procedure which we followed in the development of Blackleg Filtrate-Lederle, especially since a detailed description of the experimental work has been published in articles on Blackleg Filtrate-Lederle in the June issues of both the Journal of the American Veterinary Medical Association and The American Journal of Veterinary Medicine.

The tests undertaken with the filtrate proved that calves vaccinated with the product and subsequently injected with highly virulent material failed to develop the disease, whereas the control animals which were not given the filtrate, but were injected with the same amount of virulent material as the immunized animals, died of blackleg.

The dose of the filtrate as first prepared was 5cc. Since, however, it appeared advantageous to reduce this to a quantity which could be more conveniently handled, studies were made toward refining and concentrating the product. This has been successfully accomplished and in its present form a dose of 1 cc. possesses the desired immunizing properties; and besides, it is preserved in such a manner that its keeping qualities are assured for an almost indefinite period of time.

One of the great advantages of Blackleg Filtrate-Lederle is that it does not contain the blackleg germ in any form **and therefore cannot induce the disease under any circumstances.** At the same time, it possesses all of the immunity producing properties of the vaccine and Blackleg Extracts (Agressins). **Consequently, the Blackleg Filtrate-Lederle represents a safe and effective product for vaccination against blackleg.**

Standardization

Blackleg Filtrate is accurately standardized both on cattle and guinea-pigs. Furthermore, since it represents a laboratory product the uniformity of its potency can be accurately controlled.

The Duration of Immunity

With reference to the duration of immunity produced by Blackleg Filtrate-Lederle, investigations have proved that this lasts for at least one year; that is, the same length of time as the immunity produced by the use of vaccine or germ-free extracts.

BLACKLEG FILTRATE—LEDERLE

There is no conclusive information available whereby a permanent immunity may be produced by the use of any blackleg product.

Since claims are made that certain products produce a permanent immunity, and in view of the fact that all the available scientific information on this subject indicates that up to date no product has been developed which would confer to the animals a permanent immunity, we appealed to the United States Bureau of Animal Industry for their views on this particular matter. In a letter dated June 26, 1917, the attitude of the Bureau of Animal Industry with regard to the duration of Immunity from different blackleg products, was expressed as follows:

> "Referring to your letter of the 7th instant, concerning the duration of the period of immunity conferred by the use of blackleg germ-free extract (Agressins) as compared with the immunity following the use of blackleg filtrate, you are advised that we are not in a position to say that the immunity conferred by the use of either of these products is permanent. It is probable that this immunity may last a comparatively long period, but we agree with your statement that there has not been sufficient time as yet to say with accuracy that a permanent immunity is conferred, and had advised certain manufacturers of blackleg Agressin accordingly, prior to receipt of your letter."

Method of Administration and Dosage

Blackleg Filtrate-Lederle is administered subcutaneously and preferably in the neck, midway between the head and shoulder, using an ordinary hypodermic syringe which has previously been sterilized. At the point of injection the skin should be thoroughly cleansed with a suitable antiseptic solution.

Blackleg Filtrate-Lederle—is marketed in a concentrated form of which 1 cc. doses will afford sufficient immunity to the cattle to protect against the natural infection for a period of about a year—that is, for the same length of time as the immunity established by vaccine or by germ-free extract.

Animals To Be Vaccinated

Calves as a rule should not be vaccinated until they are six months old. Animals over two years old are seldom affected, and the mortality among them is so small as to make vaccination unprofitable. **Calves between six months and two years of age should be subjected to the vaccination.**

Time To Vaccinate

The time for vaccinating depends largely upon circumstances. In the different parts of the country there is a distinct blackleg season, and the proper time for vaccination is just before the arrival of this season. The disease, however, is mostly prevalent during the spring and fall months.

BLACKLEG FILTRATE—LEDERLE

Packages

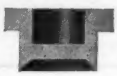


Fig. No. 1

Fig. No. 2

Fig. No. 3

BLACKLEG FILTRATE-Lederle is supplied in the special Lederle vial designed in our Laboratories with the object of giving the maximum of protection to the product as well as rendering its use convenient for the veterinarian. A brief description will demonstrate the advantages of this vial:

Figure No. 1 shows a cross section of the stopper employed in this package. It will be noted that a diaphragm of rubber, easily pierced by a hypodermic needle, completes the seal.

Figure No. 2 shows the vial with the stopper in place, the vial having been filled and stoppered under aseptic conditions in the laboratory. The stopper is securely sealed to the vial and is not to be removed.

Figure No. 3 shows the vial in the hands of the operator and demonstrates the manner in which the filtrate is removed from the vial. After moistening the top of the rubber stopper with an antiseptic solution, the operator partly withdraws the piston of his syringe, then inserts the needle through the diaphragm in the stopper. He then forces the air in the syringe into the vial and upturning the vial as in Figure 3, the filtrate will flow into his syringe. When the required amount has been removed from the vial, the needle is withdrawn and the opening made by the needle will close, effectively sealing the vial. This operation may be repeated as often as desired.

BLACKLEG FILTRATE-Lederle is supplied in three different size packages as follows:

Package containing 10 c.c. (10 doses)	$ 2.00
Package containing 50 c.c (50 doses)	8.00
Package containing 100 c.c. (100 doses)	15.00

Orders or inquiries for discounts should be addressed to our General Selling Agents, Messrs. Schieffelin & Company, 170 William Street, New York, or to one of the following branches:

CHICAGO	KANSAS CITY	NEW ORLEANS
1133 Marshall Field Annex Building	Firestone Building 20th St. and Grand Ave.	1120 Maison Blanche Building

Lederle Antitoxin Laboratories

New York

Business Opportunities

For Sale, Exchange, Help Wanted, etc., $1.00 for 20 words or less; additional words 5 cents each. Send cash with order. Add 25c. extra for correspondence when replies are sent in care of Veterinary Medicine

VETERINARY PRACTICES, POSITIONS, ETC., furnished and handled for sale in 48 states. Physicians, dentists and nurses furnished and located. Drug stores for sale and drug positions in all states. F. V. Kniest, R. P., Omaha, Neb. Established 1904.

CHICAGO.
POST-GRADUATE VETERINARY COLLEGE.

A Laboratory of Surgical Technique. An ethical scientific institution for veterinarians who desire to improve their methods and bring their knowledge up to modern standards. Personal instructions and elective courses are the prominent features. Open to graduates of accredited veterinary colleges from October 1st to July 1st. For catalog and other information address,

E. Merillat, Secretary,
1827 S. Wabash Ave.,
Chicago, Ill.

WANTED—Volumes 9, 10 and 11 of the American Veterinary Review. Address No. 274, care of VETERINARY MEDICINE.

FOR SALE—Complete sets of the AMERICAN JOURNAL OF VETERINARY MEDICINE for 1911, 1912 and 1913 (Vols. VI, VII and VIII) elegantly bound in half leather, $5.00 per volume. Complete sets for 1915 and 1916 (Vols. X and XI) bound in half leather, $3.50 per volume. Address No. 279, care of VETERINARY MEDICINE.

WANTED—Student of veterinary college as assistant at cat and dog hospital in Chicago. Address No. 291, care of VETERINARY MEDICINE.

FOR SALE—Anti-Fis-Tract, the most successful treatment on the market for all fistulous tracts. Price $1.00 per dozen. I. G. Wimsett, D. V. M., Winfield, Kan.

UNUSUAL OPPORTUNITY—Serum plant for sale, well equipped on 5 acres, out in the country, not near a stock yards; tenant house and barn, and the only plant in the state. Address No. 293, care of VETERINARY MEDICINE.

FOR SALE—At a bargain, 100,000 c.c. anti-hog-cholera serum. Address No. 294, care of VETERINARY MEDICINE.

FOR SALE—Instruments and practice in Tennessee; good location. Will quote on instruments alone if desired. Table $75.00. Going with Army Reserve Corps. Address No. 295, care of VETERINARY MEDICINE.

WANTED—On or about Sept. 1st will need a good barn man. Boozers and ex-racehorse care-takers excluded. A good job for one that is not afraid of a little work. Address Whipple Veterinary Hospital, Peoria, Ill.

FOR SALE—Practice in Northwestern Ohio in county seat of 5,000 population; practice established 21 years; will introduce new man. Good reasons for selling. Address No. 296, care of VETERINARY MEDICINE.

FOR SALE—Practice in Central Ohio. Exceptionally good location; established seven years. No competition; best of roads. Address No. 292, care of VETERINARY MEDICINE.

FOR SALE—My practice, hospital, table, etc., in county seat; population 2,000; on river, good fishing and two railroads. $2,600 business last year. Address No. 297, care of VETERINARY MEDICINE.

POSITION WANTED—By a recent graduate, single young man; references on request. Address No. 298, care of VETERINARY MEDICINE.

VETERINARIAN WANTED—One who wishes to co-operate with druggist. The best location in Northwest U. S. (Montana). Unlimited territory; no competition; nothing to buy. Country thickly settled; roads excellent; prosperous country; fine phone service. Address 1261, care F. V. Kniest, Bee Bldg., Omaha, Neb.

POSITION WANTED—By 1916 graduate as assistant to veterinarian or hospital assistant, the latter position preferred. Licensed veterinarian (Indiana). Age 47; sober; married. Address No. 299, care of VETERINARY MEDICINE.

WANTED—Copy of Hobday's "Surgical Diseases of the Dog and Cat." Address Dr. F. R. Whipple, 316 N. Adams St., Peoria, Ill.

1000 GUMMED LABELS with name and address, 50c plus 6c postage. Why pay more? Guaranteed. Send for samples. Minute-Man Printing House, Lapel, Indiana.

FOR SALE—Veterinary hospital equipped. Town of six thousand. Good farming community to draw. Part cash, balance to suit. A good opportunity for the right man. For information call or write, The Elmer D. Webb Company, Lima, O.

FOR SALE—Nebraska veterinary practice. Automobile, location, equipment and all for $375. Population 750. Fine climate. Have good business. Competition practically nothing. Fine location for veterinarian. Lively town; farmers good pay. Low price for quick sale. Stock of medicine. More work than I can do. Address 1265, care of F. V. Kniest, Bee Bldg., Omaha, Neb.

WANTED—A qualified veterinarian to take Dr. V. J. Smith's well established practice; nothing to sell but drugs and equipment. The doctor is obliged to give up his practice on account of poor health. Address K. M. Hardin, Eldora, Ia.

FOR SALE—South Dakota veterinary location and hospital; fine, neat building. Practice averaged $7,000 to $10,000 a year. One best paying practice in South Dakota. Get full details of hospital and residence (modern). At almost half price due to death. Part cash taken. Address J. W. Maher, Beresford, S. D.

"STAY THERE" EAR MARKERS

No better way of marking stock for breeding. No question about identification if animals stray. Only mark made that cannot be removed from one animal and placed in ear of another. Made of aluminum. Name, address and number stamped on tags.

TEST TAGS—Different styles numbered with large plain figures. Send for samples and prices.

WILCOX & HARVEY MFG. CO.
564-572 W. Randolph St. Chicago, Ill.

SPECIALS FOR AUGUST

Brass Injection and Suction Pump, 2 nozzle, 5 ft. tube and nozzle	Ship. wt. 4¼ lbs.	$4.50
Double Current Stomach Tube, 10 ft. red rubber	Ship. wt. 4½ lbs.	7.00
	Stylet	.50
Single Current Stomach Tube, 10 ft. red rubber	Ship. wt. 3¾ lbs.	4.00
Emasculator, curved handle, straight jaw, set screw	Ship. wt. 1½ lbs.	4.50
McKillips Canine Emasculator, curved handle, one open ring	Ship. wt. 6 oz.	3.50
Haussmann's Mouth Speculum, complete	Ship. wt. 7 lbs.	6.50
All Brass Quitman Syringe, 12 c. c. in pouch	Ship. wt. 6 oz.	1.50
As above 5 c. c.	Ship. wt. 4 oz.	1.25
Monarch Vet. Therm. Metal Case and Tail Clip	Ship. wt. 4 oz.	1.00
Colson Pig Forceps	Ship. wt. 8 oz.	1.00

All instruments are F. O. B. Chicago. Send postage with your order. We are makers of special instruments. Let us quote on your needs.

Haussmann Instrument Co., 617 Fulton St., Chicago, Ill.

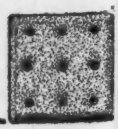
DOG CROUTONS
COMPLETE DOG FOOD

A new, perfectly balanced ration which contains all food elements in proper proportion to promote the health, strength and growth of any breed or size of dog. 28% protein.

DOGS LIKE AND THRIVE ON DOG CROUTONS
MOST CONVENIENT TO FEED

SAMPLE and BOOKLET on dog feeding FREE if you mention your dealer's name. Trial package, 10c. Regular packages, 25c, 50c and $1.00.

Dealers Wanted



Crouton Mfg. Co., Dept. V
1160 Hopkins Street Cincinnati, O.